

May
1931

AMERICAN GAS ASSOCIATION MONTHLY

Natural Gas Convention Opens May 11
at Memphis

Bottled Gas
Joins the Air Navy

Cooking by Gas
In the Clouds

What's Ahead
For the Gas Industry

ALEXANDER FORWARD

Increasing Gas
House-Heating
Sales

O. J. KUENHOLD

A. G. A. Research
in Bright Annealing
Metals

R. J. COWAN

Some Recent
Trends in Gas
Rate Structures

PAUL RYAN

Advertising Expenditures of Gas Companies

J. V. O'CONNOR



Rate List No. 9 Available

The Association's Rate List No. 9 is now available. This publication contains the following information:

1. Gas rates for all classes of service in effect on January 1, 1931, in practically every community in the United States and its Possessions, Canada and Newfoundland, together with kind of gas supplied and heating value.
2. Alphabetical listing by states of all communities served with gas and kind of gas supplied.
3. Complete list of gas companies with names of communities supplied by each company.

Owing to the increase in number of communities supplied with butane gas, a separate section has been added to Rate List No. 9 showing rates and names of companies serving butane gas in 73 communities in the United States.

Supplements to the Rate List will be issued at intervals covering the following topics:

1. Changes in rate schedules of existing companies and new rate schedules established for special classes of service.
2. New towns added to the systems of existing companies together with rate schedules in effect for this new territory.
3. Names of new companies beginning operations during the year together with communities served, kind of gas supplied and the heating value and rates charged for all classes of service.
4. Comparative analysis of Rate Lists No. 8 and 9 showing trend of rate structures during the year and increase in new rates for special classes of service.

Rate List No. 9 appears this year as Volume 1 of the new American Gas Association Year Book. The price of Rate List No. 9 is \$5 per copy to members of the Association. This charge includes the cost of the supplements to be issued during the year. **ORDER NOW—THE SUPPLY IS LIMITED.** Address orders to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

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VOLUME XIII

MAY, 1931

NUMBER 5

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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

Published Monthly by the

AMERICAN GAS ASSOCIATION

Publication Office, American Building, Brattleboro, Vt.
Editorial Offices, 420 Lexington Ave., New York, N. Y.

Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Subscription Rate \$3.00 a Year



OUR OWN WHO'S WHO



John K. Swanson



LXXII

JOHAN K. SWANSON, vice-president and general manager of the Minneapolis Gas Light Company, Minneapolis, Minnesota, was born October 6, 1881, at Parish of Canisbay, County of Caithness, Scotland. He was educated at Albion College, Albion, Michigan, of which college he is now a trustee. He entered business as meter reader in 1912, for the Saginaw Gas Company, Saginaw, Michigan, and later was named secretary of the Michigan Light Company and assistant secretary of the Consumers Power Company. Afterward he became district manager, at Jackson, Michigan, (Consumers Power Company) and in 1924 was promoted to district manager of the Consumers Power Company, Saginaw, Michigan. Mr. Swanson became associated with the American Gas and Power Company, as vice-president and general manager of its subsidiary, the Minneapolis Gas Light Company, in 1928, and was elected vice-president of the American Commonwealths Power Corporation October, 1929, and vice-president of the American Corporation in 1930. Mr. Swanson also is vice-president and general manager of the Minneapolis Suburban Gas Company, Minneapolis. He was elected president of the Mid-West Gas Association at the April, 1931, meeting of the Association. Mr. Swanson has served on several committees of the American Gas Association during the past few years. Last year he was a member of the General Nominating Committee.

AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XIII

MAY, 1931

NUMBER 5

What's Ahead for the Gas Industry?*

WHEN "the earth was without form and void," all the world was a gaseous flame. The history of the use of gas as a fuel by mankind is contemporaneous with the history of the development and use of machinery, the greatest achievement in the progress of man. When the earth becomes cold and dead, whether six thousand million years or sixteen thousand million years hence, gaseous fuel will no longer be needed nor used.

The outstanding fact in the history of the gas industry is change and its noteworthy characteristics are its resourcefulness and determination to meet the conditions of change as they arise. We have developed stability and adaptability.

From a year of business disturbance, 1930, we emerged with practically no loss in the manufactured gas business, notwithstanding its displacement in some quarters with natural gas. Likewise the natural gas side of the industry lost but very slightly, the differential being due to the larger proportion of natural gas

By ALEXANDER FORWARD,
Managing Director, American Gas
Association

used in industry with its lessened demand during that year.

In nearly every year since before the World War, the gas industry has grown in sales, in new uses, in the number of customers, in the number of security holders and in favor in the financial markets.

We could truthfully congratulate ourselves also upon the fact that our energies, devoted during the past decade to the advancement of our business and the service of the public, were free from the atmosphere of political attack. We might well do so, were it not that more recently indiscriminate attacks upon the public services, mainly for political effect, are often made to include our industry. Because of the large

Politicians Would Make Target of Gas Industry

INDISCRIMINATE attacks upon the public services, mainly for political effect, are often made to include our industry. Because of the large amount of legislation pending in national and state law-making bodies during the past winter affecting in one respect or another the industry which we represent, American Gas Association Headquarters has been obliged to devote more of its energies to the research and the literature of defense during the past four months than in all of the seven or eight preceding years combined. Mainly this is due to the reaching out for political issues by those who do not hesitate to poison and pervert the public mind for their own selfish purposes. Some of it is due merely to business quiet; some of it to the thoughtless response of inadequately informed persons to the propaganda of mischief. Ultimately we will win, for in the long run the voters of America are disposed to be fair and sooner or later put the demagogue where he belongs.—Alexander Forward.

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Ultimately we shall win, for in the long run the voters of America are disposed to be fair and sooner or later put the demagogue where he belongs. In the meantime, some of our energies must be directed to counteracting unfair attack.

Therefore, one of the bothersome yet serious things ahead for the gas industry may be the increased legislation and political activity attempt-

* Address delivered before the Mid-West Gas Association, Dubuque, Iowa, April 13, 1931.

ing to restrict the effectiveness of our service.

The enormously increased production of natural gas in recent years, with the rapidly developing methods by which it can be successfully transported over long distances, is a most important factor. Through the extension of this service many small communities are now being served with gas that could not have been so served with manufactured gas. In many larger communities where the costs of transportation from the producing field are not too great, the public is enjoying the service of a gas of higher heating value at no increase in rates and in some instances at a marked decrease. It has brought about the disappearance of noxious and injurious smoke in the cities of the South and Southwest and has made available in hundreds of thousands of homes this most valuable high-grade fuel.

The fact that Mother Nature makes no charge for natural gas produced from the ground does not mean that it can be made available on the consumers' premises at little or no cost. Nor does it mean that it can be transported over indefinitely great distances at a lower price per unit than manufactured gas. It requires millions of dollars of investment in pipe lines and compressor stations alone, to say nothing of the production costs. Then when the gas is brought to a city, all other costs, such as distribution, maintenance of mains and services and expenses of reading the meters and keeping and collecting the accounts, go on just the same as in a city using manufactured gas.

At present the supply is large and it should be used where the economics of the situation justify it, either as a sole source or, as is generally the case at greater distances, as an enriching agent for blue gas or other forms of the product. It is natural that a whole train of new problems should have arisen from the rapid expansion of this fuel across State lines and into territories heretofore served with the manufactured product. Some of these problems arise from the launching of natural gas enterprises not justified by economics and not warranted by the existence of adequate markets.

Our competition is increasingly severe. This comes from several sources. The tremendous production of petroleum is bringing about pressure in utilization of this fuel and increased efforts in salesmanship. True, it is temporary. Every customer not otherwise sold on automatic fuel, who takes to the use of oil, is an ultimate customer of the gas industry. Every oil burning installation, while not always in the interest of the customer, is in the interest of our industry in the long view.

Electricity is a considerable competitor in increasing volume. In the domestic utilization field there is no practical reason for this. In the matter of cooking, for instance, gas fuel is by far the most economical. Gas ranges have all the advantages over electric ranges in speed, in flexibility, and even in dependability, and they are fully as attractive in appearance. This applies with even more certainty in the field of water heating. The greater portion of sales of electric ranges are to homes where no gas service is available, and the remainder of these sales are brought about by aggressive sales policies or where the rate situation is unfavorable or gas salesmanship is as yet insufficiently developed. We can and will maintain our supremacy in the present domestic loads for gas service.

The coal industry, handicapped for years by over-production and harassed by intense competition with petroleum and its products, is going about vigorously to improve its service and to advertise and to acquaint the public with its claims. We do not generally assert competition with coal on a straight cost basis but sell our product on other advantages. Looking ahead to the time when the oil and natural gas reserves of the country approach depletion, and the remaining supplies are carefully safeguarded for certain specialties at relatively high costs, and when the burning of raw coal will be confined in the main to industries like ours, coal will remain the final raw fuel of the world, and from it will be extracted not only the heat and power but also priceless

chemicals and by-products indispensable to an advancing civilization.

That is why, regardless of the availability of other sources of fuel supply, the gas industry must retain its superlative technical skill in gas production and develop its interest in and usage of the products of the carboniferous strata.

In the industrial field our potentialities will become still greater through careful and continued research directed to the ascertainment of the fundamental facts of gas utilization and to the development of efficient industrial gas burning appliances. With loyal support and cooperation of manufacturers, we are daily equipping ourselves more effectively in meeting the competition of other fuels and in adding to our industrial load.

Let me repeat what has been said before and that is that we have a basic and essential fuel, the most attractive and efficient appliances in our history, excellent and advancing knowledge of proper rate making, the finest technical skill, sufficient financial strength, adequately informed leadership, the power of individual and collective growth.

It is not enough that we know this; it is ever our job to adequately inform our present and potential customers. We have shown a notable advance in the scope and conceptions of our advertising yet our expenditure for this purpose is still extremely modest and out of proportion to that employed by other industries in the same class.

We are making noteworthy progress in equipping our employees whose duties bring them into contact with the people. The enthusiasm with which the American Gas Association's courses in domestic gas salesmanship, in industrial gas salesmanship, in sales management, with the tremendously popular course in employee-customer relations, have been received by the industry is significant of the future success of the industry. That they have been utilized by most of our companies is the highest guarantee that the gas industry is awake to its opportunities and alert in its view of its possibilities. The effects of this work are cumulative; they will

result in a marked change in the appreciation by the public of what we have to offer and increase our determination to reach for the goal of perfect service.

Our research is by no means confined to the purely industrial field. The industry through the Association is financing definitely conceived and well-organized programs of research into the problems of production and transmission of natural gas and the conservation of this most valuable fuel; into pipe joints and pipe coverings; and into the performance of domestic appliances under all conditions. Other fields of research include house cooling and air conditioning, for which the future is indeed very promising. We are proceeding steadily in our co-operative program with the Bureau of Mines into the gas, coke and by-product making qualities of American coals, the value of which has been recognized by the Association.

The collection and interpretation of the statistics of an industry must be one of the most important duties of its national organization. As our industry expands in sales and usefulness to the public of necessity statistical work must be enlarged to have available at all times accurate and adequate information concerning the industry.

Any proper conception of the duty of our industry to its public includes making available the safest and most satisfactory means of utilizing our product. To this end, as you all know, the American Gas Association established and later housed in its own property the Gas Appliance Testing Laboratory in Cleveland. The tests there undergone are based upon requirements established through the most careful study, thought and research, by the most competent experts, and represent the combined thought of all interested agencies. It has been said officially by the Association that domestic gas-burning appliances not bearing the Laboratory Seal of Approval ought not to be placed on our lines. The support and encouragement given to the work of this Laboratory by the industry generally is most gratifying and significant.

As the testing of appliances becomes more and more of a routine matter, we may expect the Laboratory to gradually unfold in research work for the industry and to assume the aspect of a great institution upon which the industry may draw for the essential technical facts concerning its service.

We have to remember, and indeed we would not be allowed to forget, that other people sell appliances besides our utility companies. There was little or no problem in this respect in the days of gas lighting. When gas entered the field of domestic fuel supply, it became necessary to develop and get into our customers' homes the appliances through which our product could be utilized and the gas companies and the manufacturers of appliances bore the main burden of the sales efforts. Their salesmen and their advertisements went everywhere and they created the market in increasing volume. Others had a right to the market made by the gas companies and so appliances came to be sold by department stores, hardware stores, furniture stores, and by plumber dealers. This business was naturally extended to the chain stores and mail order houses. These people are in business to make a living, as we all are. It seems manifest that the best policy for the present and future lies in intelligent cooperative efforts with selling agencies with whom we may be to some extent in competition, yet whose interests are allied with ours.

There are outstanding examples of mutually profitable cooperation between gas companies and dealers and in the industry generally. This situation is fairly satisfactory. It is my belief that it will become more satisfactory when cooperation is more general. Certainly enmity and suspicion and legislation are not to the interest of any person or corporation who deals in gas appliances.

What, then, is ahead for the gas industry?

Increasing confidence within the industry and with the public in the indispensability of our product and in our adaptability to meet the challenge of changing conditions.

Realization that we are in a world

of demand for comfort, convenience, labor saving, elimination of drudgery, better satisfaction in living, and that we have a supreme service to offer.

The courage and wisdom to deal with unwise legislation and with malicious or uninformed political attack.

Keener competition with other fuels, met by the best informed and equipped sales methods, largely through the Association program of education in salesmanship, sales management, sales engineering and in employee-customer contacts.

General recognition of house-heating, house-cooling and air-conditioning by gas, with a consequent balancing of the load factor.

Utilization and distribution by the gas industry of available fuels, determined by sound economics and continuity of supply.

Universal acceptance of the results of our appliance testing program by the gas companies, the manufacturers, and the customers.

More advertising.

Resolute prosecution of research, without which no industry can hope to survive in this age; not only in the present fields but in gradually broadening scope; centering largely in the Cleveland Laboratory.

Sincere cooperation for mutual benefit with other industries and trades whose interests are allied with or related to ours.

A supply of natural gas over a large portion of the country for a considerable period of years, indeterminable as yet by geologic laws or surveys followed in the process of time and the growth of conservation by a gradual return to the use of manufactured gas, possibly transported over considerable distances, and likely by that time to be affected by the advance of science in the perfected utilization of coal and its by-products.

"How to Read a Meter"

Meter reading cards are being distributed by the Oklahoma Natural Gas Corporation to its consumers in order that they may easily keep information on the amount of gas consumed. These cards give instructions on how to read a meter and have space for a two-year record. Supplies of these cards are being sent by the company to each city which it serves.

Natural Gas Convention To Draw Large Attendance

ADVANCE hotel reservations indicate that the Annual Convention of the Natural Gas Department, American Gas Association, which will open at Memphis, Tenn., May 11, continuing through May 14, will attract an unusually large attendance.

All sessions will take place at the Hotel Peabody, which will be Convention Headquarters.

The entertainment program promises to be one of the outstanding features of this annual event, which attracts representatives of the natural gas industry from all parts of the country.

Many delegates will travel on special pullmans leaving Pittsburgh at 9:40 A.M., Sunday, May 10. This special train will pick up members on their way to Memphis at Steubenville, Columbus, Cincinnati and Louisville. This train will arrive at Memphis at 7:55 A.M., Monday, May 11, which will be in ample time for all business sessions and entertainment events. Those desiring space on these special pullmans should communicate with Arthur Booth, Pittsburgh Supply Company, 435 Water Street, Pittsburgh, Pa.

At noon Monday, the natural gas delegates will enjoy an old-fashioned southern barbecue, at the Ridgeway Country Club. That afternoon arrangements have been made for golf at the Ridgeway, Memphis, Colonial and Chickasaw Courses. For those not desiring to play golf a sight-seeing trip has been arranged.

Monday night, a wrestling match will be staged at the City Auditorium for the benefit of all those in attendance.

There will be a grand ball at the Hotel Peabody for all members and guests. This function will be informal.

The annual banquet of the Natural Gas Department will take place in the ball room of the Hotel Peabody, Wednesday night. There will be no speakers, but cabaret entertainment will be provided.

At 1:00 o'clock Tuesday afternoon



Hotel Peabody, Memphis—Convention Headquarters.

there will be a luncheon and musicale for the benefit of the ladies. This will take place at the Nineteenth Century Club.

At 1:00 o'clock Wednesday afternoon a bridge luncheon will be held at the Memphis Country Club.

Committees in charge of the various convention arrangements are as follows:

General Arrangements Committee—W. J. O'Brien, *Chairman*, Memphis, Tenn.; B. C. Adams, Kansas City, Mo.; J. B. Corrin, Pittsburgh, Pa.; H. L. Dickerson, Houston, Texas; Edgar G. Hill, New York, N. Y.; Alfred Hurlburt, Chicago, Ill.; William Moeller, Jr., Los Angeles, Calif.; J. R. Munce, Shreveport, La.; F. F. Schauer, Pittsburgh, Pa.; D. C. Shaffer, Memphis, Tenn.; T. R. Weymouth, New York, N. Y.;

Program Committee—E. F. Schmidt, *Chairman*, Dallas, Texas; W. A. Dunkley, Memphis, Tenn.; L. Fitzpatrick, Salt Lake City, Utah; T. H. Kerr, Columbus, Ohio; J. H. Maxon, Omaha, Neb.; A. E. Merchant, New

Orleans, La.; H. L. Montgomery, Bartlesville, Okla.; W. B. Trammell, Houston, Texas; George Wehrle, Denver, Colo.; W. S. Yard, San Francisco, Calif.

Publicity Committee—Paul Renshaw, *Chairman*, Memphis, Tenn.; J. C. Barnes, New Orleans, La.; William C. Grant, Dallas, Texas; C. D. Greason, Kansas City, Mo.; R. S. McBeth, Tulsa, Okla.

Hotels Committee—J. J. Brennan, *Chairman*, Memphis, Tenn.

Reception Committee—W. N. Ford, *Chairman*, Memphis, Tenn.

Hostess Committee—Mrs. W. D. Kyser, Mrs. W. J. O'Brien, *Co-Chairmen*, Mrs. J. J. Brennan, Miss Oma Buchanan, Mrs. W. A. Dunkley, Miss Selma Cohn, Mrs. W. N. Ford, Miss Mamie Phelps, Mrs. H. S. Jones, Miss Grace Reinsch, Mrs. L. M. Long, Miss Mary Stone, Mrs. W. S. Myrick, Miss Lucretia Tiffany, Mrs. D. C. Shaffer, Miss Christine Wigal.

The program of business sessions follows:

To Speak at Memphis Convention



1—B. M. Nowery, 2—R. W. Gallagher, 3—R. M. Stuntz, 4—L. L. Dyer, 5—J. C. Diehl, 6—E. N. Watkins, 7—H. S. Bean, 8—W. B. Berwald, 9—E. L. Rawlins, 10—Alexander Forward, 11—D. A. Sillers, 12—P. McDonald Biddison, 13—J. B. Tonkin, 14—H. J. Hoover, 15—S. W. Meals, 16—H. D. Hancock, 17—E. D. Milener, 18—J. French Robinson.

May 11

10:00 A.M.

Meeting of the Main Technical and Research Committee and sub-committees, Room 209, Mezzanine Floor, Hotel Peabody.

11:45 A.M.

Buses leave Second Street entrance of Hotel Peabody for the Ridgeway Country Club. The old-fashioned Southern Barbecue begins at 12:30.

AFTERNOON

Golf privileges have been arranged for at the Ridgeway, Memphis, Colonial and Chickasaw Golf Clubs.

2:45 P.M.

Sight-seeing buses will leave the Ridgeway Country Club.

5:00 P.M.

Meeting of the Managing and Advisory Committees, Natural Gas Department, Room 212, Mezzanine Floor, Hotel Peabody.

6:15 P.M.

Annual Dinner, Managing and Advisory Committees, Natural Gas Department, Room 213, Mezzanine Floor, Hotel Peabody.

8:00 P.M.

Wrestling Match at Ellis (Municipal) Auditorium.

EVENING

Ladies' Theatre Party at the Orpheum Theatre.

TUESDAY

May 12

MORNING—9:30

1. Opening Remarks by the Chairman.
H. C. Cooper, *Chairman*,
Natural Gas Department.
2. Invocation.
Very Reverend Israel H. Noe,
Dean of Saint Mary's Cathedral,
Memphis, Tenn.
3. Address of Welcome.
Hon. Watkins Overton,
Mayor of Memphis.

4. Address of the Chairman.
H. C. Cooper,
Hope Natural Gas Company,
Pittsburgh, Pa.
5. Appointment of Committee on Chairman's Address.
H. L. Montgomery, *Vice Chairman*,
Natural Gas Department.
6. Address.
Alexander Forward, *Managing Director*,
American Gas Association.
7. Gas, Its Place in Our Time.
R. W. Gallagher,
East Ohio Gas Company,
Cleveland, Ohio.
8. Selling Natural Gas.
B. H. Gardner,
Columbia Gas and Electric Corporation,
Columbus, Ohio.

TUESDAY AFTERNOON

2:00

1. Natural Gas Statistics, Their Value.
L. L. Dyer,
Lone Star Gas Company,
Dallas, Texas.
2. Wrinkles.
H. J. Hoover,
Cincinnati, Ohio.
3. Safety in the Industry.
E. J. Sullivan,
Arkansas Natural Gas Corp.,
Shreveport, La.
4. Our Main Technical and Research Committee.
H. D. Hancock,
Henry L. Doherty & Co.,
New York, N. Y.
5. Gas Measurement.
H. S. Bean,
U. S. Bureau of Standards,
Washington, D. C.
6. Pipe Line Flow.
W. B. Berwald,
U. S. Bureau of Mines,
Bartlesville, Okla.
7. Gas Well Deliveries.
E. L. Rawlins,
U. S. Bureau of Mines,
Bartlesville, Okla.

8. Gas Makes Its Entry into the House Cooling and Air-Conditioning Field.
E. D. Milener,
American Gas Association,
New York, N. Y.
9. Compression and Transmission of Natural Gas.
P. McDonald Biddison,
Southern Natural Gas Corporation,
Birmingham, Ala.

WEDNESDAY

May 13

MORNING—9:30

Drilling Symposium

The entire morning will be given over to a discussion of drilling. Each speaker, following a prescribed outline for easy comparison, will give a presentation on the subject covering his section of the country. After the three presentations, the meeting will be open for a general discussion of drilling.

For the East.

J. French Robinson,
Hope Natural Gas Company,
Pittsburgh, Pa.

For the Mid-Continent.

B. M. Nowery,
United Gas Public Service Co.,
Houston, Texas.

For the Pacific Coast.

L. M. Spencer,
Southern California Gas Co.,
Los Angeles, Calif.

WEDNESDAY AFTERNOON

2:00

1. Natural Gas Fellowships.
J. B. Tonkin,
Peoples Natural Gas Co.,
Pittsburgh, Pa.
2. A Uniform Classification of Accounts.
E. N. Watkins,
Arkansas Natural Gas Corp.,
Shreveport, La.
3. Detection and Prevention of Distribution System Leakage.
J. A. Martin and
L. B. Denning, Jr.,
Lone Star Gas Co.,
Dallas, Texas.

4. Modernism in Distribution Design and Operation.

G. J. Heckendorn,
Public Service Co. of Colorado,
Denver, Colo.

5. The Origin of Dust and Its Elimination.

D. A. Sillers,
Lone Star Gas Co.,
Dallas, Texas.

6. Field Testing of Large Positive Meters.

John C. Diehl,
Metric Metal Works,
Erie, Pa.

THURSDAY

May 14

MORNING—9:30

1. Production Symposium.

The three speakers on the Production Symposium will each follow a prescribed outline and will deal with the subject for their sections of the country. The meeting will be open for a general discussion after the three presentations.

For the East.

S. W. Meals,
Carnegie Natural Gas Co.,
Pittsburgh, Pa.

For the Mid-Continent.

R. M. Stuntz,
Cities Service Gas Co.,
Bartlesville, Okla.

For the Pacific Coast.

Wm. Miller, Jr.,
Southern California Gas Co.,
Los Angeles, Calif.

2. Report of Committee on Chairman's Address.

3. Report of Committee on Final Resolutions.

4. Closing Remarks.

Range Manufacturers Called to Meet

UNDER the auspices of the Manufacturers' Section, American Gas Association, manufacturers of the gas ranges have been called to meet at the Greenbrier Hotel, White Sulphur Springs, W. Va., May 7 and 8, for the purpose of organizing a "gas range division." Notices of the meeting have been sent to range manufacturers by P. O. Dietsch, manager of group activities, Manufacturers' Section.

Harlow C. Clark Dies At New Jersey Home

HARLOW C. CLARK, director of publicity, Public Service Electric & Gas Co., Newark, N. J., died April 10 at his home in East Orange, N. J. He had been in ill health for a long while.



H. C. Clark

Mr. Clark was well-known throughout the gas industry, and was active in the work of the American Gas Association. He was former chairman and at the time of his death a member of the Managing Committee, Publicity and Advertising Section, and also chairman of the Committee on Nominations.

Mr. Clark was a former newspaper man and an authority on public utilities, having written a book, "Service at Cost Plans," on electric railway franchises and numerous utilities articles.

Born in Syracuse, N. Y., Mr. Clark worked in the freight and transportation departments of the New York Central Lines and the Lehigh Valley Railroad, and in 1892 returned to Syracuse, where he entered the employ of *The Syracuse News* and *The Reporter*. Later he was Sunday editor of *The Syracuse Herald* and city editor of *The Syracuse Journal*.

In 1903 Mr. Clark became secretary to the Mayor of Syracuse and in 1905 secretary of the Syracuse Chamber of Commerce. After that he was Public Safety Commissioner in Syracuse and again secretary of the chamber. In 1911 he became an editor of *The Syracuse Journal* and in 1912 he did publicity work for the firm of Allen & Peck, Inc. One year later he became editor of *Aera*, magazine of the American Electric Railways Association. In 1920 he took the position which he held last.

He is survived by his widow, Mrs. Mary C. Clark, and two sisters.

Heart Attack Fatal To DeWitt Clinton

DEWITT CLINTON, secretary and assistant treasurer of the New England Gas and Electric Association, died in Cambridge, Mass., of a heart attack on March 28.



DeWitt Clinton

Mr. Clinton was well-known in the gas industry, having served as a member and former chairman of the Managing Committee, Accounting Section, American Gas Association. He was much interested in the development of the section's committee activities and his

death is regarded as a distinct loss by his colleagues.

A native of Waterbury, Conn., Mr. Clinton passed most of his life in Worcester, having moved to Cambridge about two years ago. He was a director of the Worcester Bank and Trust Company and of the Central Trust Company, Cambridge. He was senior warden of St. John's Church, Worcester.

Mr. Clinton had been in ill health for several years. A week before his death, he was stricken in New York while preparing for a voyage to New Orleans, but was able to return to his home, where he lingered several days.

Memphis—

City Which Will Welcome 1931 Natural Gas Convention Has Fuel Piped from Monroe Fields

MEMPHIS counts itself happy to have the annual

convention of the Natural Gas Department of the American Gas Association this year. Our own company is particularly pleased in having the group of leaders in the industry gather in our city for this event.

Within the past five years Memphis has grown to be the principal "Convention City" in the South, though there are several other cities in the South larger; and it is one of the leading convention cities in the entire country, though it ranks about thirty-fifth in size. One reason for this high rank which the city has taken in this respect is the very complete hotel facilities afforded here. The Hotel Peabody, which is headquarters for the convention, is acknowledged to be, as its advertising states, "The South's finest and one of America's best."

Natural gas was introduced into Memphis the first of January, 1929. The pipe line is owned and operated by the Memphis Natural Gas Company which has its offices in Memphis. The line gets its supply from the Monroe fields in Louisiana, is 210 miles long, 18 inches in diameter; and, operated at a pressure of 300 pounds, makes available to Memphis approximately 60 million cu.ft. of natural gas daily.

By **PAUL RENSHAW**
Advertising Manager,
Memphis Power & Light Co.

miles below Greenville, Mississippi; and from this line a number of towns, including Greenville, Cleveland, Clarksdale and others along its route in Mississippi are supplied with gas.

Gas is delivered at the city gate by the Memphis Natural Gas Company to the Memphis Power & Light Company which distributes it in Memphis.

Preparatory to introduction of natural gas in Memphis, the Memphis Power & Light Company overhauled its high-pressure distributing mains according to most approved methods. In addition to this overhauling of the high-pressure mains, three welded steel special mains have been laid. One of these is an 18-inch belt line, nine miles in length, reaching from the southwest part of the city to the northeast section, serving a large area recently annexed by the city. A special 16-inch high-pressure main was also built to serve the downtown business section; and another 16-inch welded steel main was laid to serve the electric power plant of the Memphis Power & Light Company which uses gas for its power in generating electricity.

Prior to the introduction of nat-

The line crosses the Mississippi River at a point about ten



Paul Renshaw

ural gas, the local company distributed manufactured gas and it is interesting to note that manufactured gas was first distributed in Memphis in 1852.

Since the introduction of natural gas twenty-eight months ago, consumption has been increased two and one-half times. The number of consumers likewise has been materially increased.

Natural gas for commercial and industrial heating has been favorably accepted by the business interests of Memphis. Practically all the large downtown office buildings now use natural gas for fuel. There are only three exceptions to this rule; and two of these buildings are offered for sale by their owners who are reticent to add further to their investment.

Many large manufacturing concerns also have adopted natural gas, finding it to be an ideal fuel in its flexibility of use. It may be particularly noted that every large bakery in the city is using natural

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Walter R. Addicks, Noted Gas Engineer, Passes Away

WALTER ROBERTS ADDICKS, senior vice-president of the Consolidated Gas Company of New York, director of a dozen associated utilities and a noted engineering figure in the gas industry of the United States, died April 14 on his seventieth birthday.

He was engaged in his work of improving the plant and process of making illuminating gas in the metropolitan area until April 9, when he contracted pneumonia after a visit to Green Mountain Lakes Farm at Powling, N. Y., a health resort which he caused to be established four years ago for the employees of the gas and electric companies with which he was associated. He died in his home at Greenwich, Conn., which he bought from William A. Rockefeller about a year ago.

During his life Mr. Addicks designed, built and started the operation of more than a score of gas plants in Boston and New York. His only hobby was gas engineering. He gave up golf about four years ago.

Several months back he suffered from a heart attack. Recovering quickly, he resumed work on the location of gas mains in the suburbs.

The American Gas Association Meritorious Service Medal, awarded each year for the individual judged to have performed the most meritorious act in the gas industry within a twelve-month period, was made possible through the generosity of Mr. Addicks. He was an active member of the Association. He also was a member of the American Society of Naval Engineers, National Electric Light Association, Illuminating Engineering Society, Army Ordnance Association and other technical societies. His

clubs were the Union League and Army and Navy of New York, Mount Kisco (N. Y.) Golf and Bedford (N. Y.) Farmers.

Mr. Addicks was born in Philadelphia in 1861. He attended the Episcopal Academy at Philadelphia, for three years and then entered the United States Naval Academy at Annapolis, graduating in the Engineer Corps in 1882.

He resigned from the navy in 1883 and entered the employ of the Pennsylvania Railroad at Altoona, Pa., drafting and later designing locomotives, cars and shops. He became surveyor of the railroad's shops and shop-yards east of Pittsburgh and Erie in 1885. Two years later he became engineer of the Beacon Construction Company of Boston.

Mr. Addicks designed and built the Bay State gas plant in Boston, and became chief engineer of the Bay State, the Boston, the Roxbury, the South Boston and the Dorchester Gas companies. He also built and started the operation of the plant of the Queen City Gas Company at Buffalo, and became consulting engineer of the Brooklyn, the Metropolitan and the Citizens Gas Companies of Brooklyn, the Massachusetts Pipe Line Gas Company and the New England Gas and Coke Company and chief engineer of the gas and electric plants of the Brookline (Mass.) Gas Light Company.

Mr. Addicks went to New York in 1903, to be the Consolidated Gas Company's senior vice-president and director of its subsidiaries, continuing as such to his death.

He abandoned engineering temporarily during the Spanish-American War in 1898 to return to the naval



Walter R. Addicks

service as a lieutenant, senior grade. He commanded the U. S. S. Huntress and the U. S. S. Eileen, which were detailed to place mines in New York harbor.

During the World War, Mr. Addicks served on the technical committees of the American Gas Institute and the Council of National Defense, and was in charge of the Consolidated Gas Company's operation of government plants producing toluol, carbon and soda lime.

He is survived by a widow, who was Miss Margaret Jardine of New York, at their marriage in 1890. His brother, Frederick P. Addicks, former president of the Amalgamated Copper Company, died several years ago.

Funeral services were held at the home in Greenwich, April 16. Burial was in Sleepy Hollow Cemetery, North Tarrytown, N. Y.

The American Gas Association was represented at the funeral by Clifford E. Paige, president, Louis C. Smith, assistant to the managing director, K. R. Boyes, secretary and H. W. Hartman, assistant manager.

A. G. A. Research In Bright Annealing Metals



R. J. COWAN

FOR many years the interest in industry in bright annealing of metals has been keen, for it has been felt that probably the next logical step in the improvement of metal working processes would be along this line. Many investigators have been at work and many interesting results have been obtained. However, these have not been of wide application and have been the cause of considerable difficulty when it has become necessary to alter the heat treatment or to change the operation in any degree, which is generally the case. Therefore such applications have been confined, for the most part, to the annealing of metals that are easy to keep bright.

Realizing the possibilities in this field for the sale of gas if proper processes and equipment could be developed, the Committee on Industrial Gas Research of the American Gas Association has devoted its energies to the solution of the many problems involved. An elaborate research and development program has been conducted at the laboratories of the Surface Combustion Corporation of Toledo, Ohio, extending into a number of well-known brass plants.

The field for the sale of gas for bright annealing is a large one. Practically all metals have to be annealed one or more times during their fabrication. This requires heat. Unfortunately, most metals lose their brightness when being annealed, and it is generally a long,



Continuous gas-beated bright-annealing furnace for stampings, using methanol process. Developed through A. G. A. Research.

By R. J. COWAN
Metallurgical Engineer,
Surface Combustion Corporation

costly process to restore that brightness, chiefly by means of pickling. The object of the American Gas Association's research and development work at the Surface Combustion Corporation is to devise ways of annealing metals with gas and still retain a bright surface.

When one first takes up the consideration of bright annealing the first thought concerns the possibility of using some of the common neutral or reducing gases for an atmosphere. This would seem to be quite logical because the tarnishing of metals during annealing is due to the formation of oxides on their surfaces. The problem at first would seem to be to prevent the formation of these oxides either by the use of a gas that is neutral or of one that is slightly reducing in its action. Consequently, as a rule the first attempts that have been made in studying this problem have been along these lines.

Factors Affecting Bright Annealing

There are certain instances where bright annealing may be accomplished in this way but the range is very limited indeed and any attempt to apply these processes along broad lines has always resulted in failure. Because of this, we have come to think of bright annealing under two broad classifications.

1. Those applications that depend upon the use of a particular atmosphere that is inert, or slightly reducing in its effect on the metals. These we have come to refer to as "gas annealed."

2. Those applications where definite chemical reactions must take place between the metal and the atmosphere whereby oxides are reduced. These are the true "bright-annealed" metals.

The American Gas Association research has shown further that the problem of bright annealing is complicated by two facts of very great importance. The first of these is that when a metal is heated beyond a certain temperature it gives off from itself different amounts of gases, which of themselves are of an



Charge end of the furnace. At the extreme left is a bright-annealing furnace developed under A. G. A. Research.

oxidizing character, and second, the products of reaction between the gas atmosphere and the metal are of themselves oxidizing to the metal at low temperature.

The fact that metals give off different gases when heated and that these gases of themselves are oxidizing, is a matter of very great practical importance in connection with the subject of bright annealing. It is seen at once that when the annealing temperature is high enough to cause these gases to be evolved the metal will be oxidized and the presence of any neutral atmosphere surrounding the metal will not of itself insure bright annealing. It is also apparent that the usual reducing gas atmosphere under these conditions may reduce this oxide if the temperature is high enough, but it will be reformed on the metal again in cooling from annealing temperatures.

Of all the metals that are usually considered it has been found that the zinc-containing metals are most difficult to bright anneal. The reason for this is that zinc as a metal is highly volatile when heated and that it is very easily oxidized. It has been found that a very small percentage of zinc in any alloy makes the bright annealing of that alloy very difficult and this fact alone removes all such metals from the class of those that can be given the gas anneal by means of a neutral or slightly reducing atmosphere.

annealed very easily in the presence of gases which of themselves would be highly oxidizing and wholly unsuitable for this purpose. This discovery is a matter of very great importance and furnishes the basis for developing a process, and gas equipment for interpreting it, on which the solution of this problem depends. It has been found that flue gas is quite unsuitable for this work because of the high content of CO_2 , which of itself is highly oxidizing to brass and similar metals. However, if flue gas be made a carrier by means of which certain organic vapors can be brought into the annealing chamber, the vapors in dissociating under heat will react with the metal oxides and this reaction will take place regardless of the presence of certain other oxidizing gases. A process has therefore been developed whereby these organic vapors may be introduced into a flue gas atmosphere and used for bright annealing various

The most widely used zinc-containing alloy is brass.

The Methanol Process

Considerable work on this matter in connection with this research has developed the fact that it is possible to take advantage of certain selective reaction rates whereby zinc-containing metals may be

materials. Under these conditions the gases which make up the flue gas, containing as they do from 8 to 10 per cent of CO_2 , may be used for bright annealing very successfully. The flue gas, however, must be especially prepared, composition closely regulated, and be free from moisture.

The method just outlined is one particular application that may be broadened and used with a great deal of flexibility. Enough has been said to indicate that in addition to the atmosphere surrounding the metal, the matter of temperature has a very decided effect and that under the influence of temperature the atmosphere may act in a selective manner so as to permit the carrying on of certain desirable reactions at the same time preventing many undesirable ones.

The problems that arise in industry in connection with this matter are of a varied nature and each one demands separate consideration and particular application of these ideas. The annealing of brass stampings and of nickel silver shapes requires a different set up and different ways of working from that of annealing strip or wire. The broad principles that have been outlined in this article find ample application to each of these fields and equipment is available for bright annealing any ferrous or non-ferrous metal or alloy in a satisfactory manner.

It has been found in this research

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Discharge end of the furnace.

Modern Merchandising Introduces All Gas "Kitchen Kompact"

By BERNICE BOWSER

MODERN merchandising means to give your public what they want, when they want it, and at a reasonable price. Notice that the price is mentioned last. What is reasonable is always debatable. In the gas industry everything you have to sell is so very inexpensive, compared with the value of what you give, that price should not be a factor for consideration, except as an asset.

The gas industry is not handicapped because of the cost of gas service, but it is handicapped because the gas bill, like alimony, the income tax, the electric bill and the telephone bill, must be paid when it is due. You may hold a department store's, florist's, doctor's bill or shoe-maker's bill and nobody gets excited. These people know that eventually you'll pay them and you'll continue to patronize them. If they grow "snooty," you can pay and close the account and go elsewhere to a more courteous dealer. It is human nature to loathe the things you can't change. And in spite of all the educational work which has been done, the tongue of the gas industry employee at times is tart.

It is, also, human nature to take for granted those things which come to you without effort and without price. A mother's love, freely given and the most precious thing on earth, is rarely appreciated until you have lost it. If it were possible to cut off the gas service in a town for two or three days, would the public appreciate the value of gas service?

This lack of appreciation, due to



Model of the first "Kitchen Kompact," the new all-gas kitchen as displayed by The Brooklyn Union Gas Company

the fact that gas service is accepted as part of living, just as the sunrise and spring flowers are accepted, should be recognized and evidence of the constantly increasing value of the service be presented in a spectacular manner. Publicity of a subtle type, in tempo with the interests of the day, should be used to overcome certain definite handicaps, one of which is the general belief that gas

is old style. The recent modernization of gas ranges offers a splendid opportunity for the injection of human interest appeal, or "sex appeal in merchandising."

The advertising value of this type of merchandising has been recognized by John F. Weedon, superintendent of advertising, The Peoples Gas Light & Coke Co., Chicago, who dramatized the first annual

style show of modern ranges staged by W. R. Evans, merchandising manager. The corridors of the Peoples Gas Building were lined with an intriguing array of modern ranges, with new lines, new colors, new efficiency points. By invitation, several thousand employees were given a pre-view of the exhibition. This was a masterly stroke because employees certainly need to grasp the modern note—to catch the feel of the new style—before the public is invited, in order that they may be able to answer questions intelligently and to talk enthusiastically.

To tie in closely with the modern style thought, Marshall Field & Co. on "Employees' Night," exhibited, on charming manikins, clothes for 1931 suitable for the many employees of the Peoples Gas Company who appreciate smart clothes and, also, appreciate the wisdom of living within their budgeted allotment for clothes.

I believe that this modern attitude toward exhibitions will prove of such value that I shall look forward to Chicago's 1932 second annual style show in modern ranges. This is modern merchandising of the highest type and another year will without doubt present interesting new developments.

Brooklyn held its fortieth annual food show recently and, if you had attended the exhibit at any hour of the day, you would have found a crowd of women around one particular exhibit,—that of the Brooklyn Union Gas Co. Probably 100,000 women saw this exhibit and just as many women were keenly interested in it and are talking about it. It was a brand new idea. It was modernity in her latest garb. It gave women what they want,—something new, clean and pretty. It saved time and effort. It was small, compact—qualities that touch a woman's heart. It lived in the kitchen where every homemaker must spend some time during the day. It was the first complete, "all gas kitchen," the first "kitchen kompact."

Hugh Cuthrell, merchandising manager of the Brooklyn Union Gas Co., was responsible for this original idea and I believe that he has developed an idea which has more pos-

sibilities for real publicity than anything I have seen in gas industry merchandising.

Mr. Cuthrell has thrown over his shoulder the fixed idea that this is an old, conservative industry, devoid of style appeal. He has cleared his mind of all preconceived ideas of what "can be done" and what "cannot be done" in the gas industry and he has looked at his personal problem with clear vision. He has in his territory 300,000 old houses with big, clumsy kitchens. Many owners of these brownstone front houses would like to make each floor into a small apartment, if it were not for the problem of the kitchen. At one masterly stroke Mr. Cuthrell has worked out a way to install in old kitchens, in new kitchens, in attics, in detached houses where a mother-in-law lives and an accessory kitchen is desirable for family happiness, a neat, efficient, complete gas kitchen.

Look at the accompanying picture of this "kitchen kompact." It has been worked out with the aid of a far-seeing cabinet maker. It is trim, neat and attractive. The very name "Kitchen Kompact" intrigues a woman. She may go out without a handkerchief and not be disturbed, but, if she forgets her compact, which holds powder, rouge and lip stick, she is, indeed, in a bad way!

I understand that the intention is to make these "Kitchen Kompacts" in three sizes. Each section is separate so that it may be installed in a line, as is the one shown, or scattered to meet the demands of the place where it is to be used. The complete "compact" shown is 9 ft. long and 6 ft. high so that the average woman may reach every shelf. It will be available in two colors; a light neutral tone which will fit into any room, regardless of the color combination, and in the ever popular cool green.

On the right-hand side is the gas refrigerator with compartments above for food stuffs that do not belong in the refrigerator. Next to this is the modern range. A number of manufacturers of gas ranges will cooperate in putting over the big idea of the all gas kitchen as shown in the "Kitchen Kompact."

The Kohler Company has cooperated in producing a sink beneath which will be the small laundry tub. Silk underwear makes it desirable for a woman to do a little washing every day or every other day. Making it easy for women to wash small lots of clothes, increases the demand for automatic storage hot water service. The doors under the sink turn in, so that a woman may stand comfortably and wash dishes.

There is room for the garbage pail under the sink. The kitchen cabinet at the extreme left is modern and complete. It houses all that a woman needs in her kitchen. There is a drainer for dishes on top of the cabinet shelf. Above the range, shelves connect the kitchen cabinet with the refrigerator, forming a neat ensemble.



Hugh H. Cuthrell, Merchandise Manager, The Brooklyn Union Gas Company

At this "Kitchen Kompact," in an incredibly small space, a woman may do all she needs to do in the business end of her kitchen. She may have a small table on rollers for utility and use the balance of her kitchen for a dining space or for whatever she may desire.

And what about the price? I'm told that on the part payment basis, over a period of months, the "Kitchen Kompact" can be retailed for less than \$500. Now, what is \$500? Is it a lot of money? It isn't when one buys a car! Since all prices are relative, who shall say whether it is expensive?

My experience in merchandising has convinced me that it requires no more sales effort to sell one big item, when it has real value, than it requires to sell several small items

to the same customer. There is a reduction in sales cost as well as in effort. If women want these complete, compact new units, one need not worry about the cost. They will find a means of paying for them.

There are consecutive steps in making people conscious of the value of gas service, and I rather suspect that the beginning is to retain the cooking load, install the refrigerator and then carry on with a modern hot water heater and a gas furnace. I am inclined to believe that there is little chance of selling house heating to people who are living with old style kitchens. Sell modern gas service in the kitchen and, when that installment has been paid, you can logically follow up with a house heating sale. Your potential quick market for house heating lies with the people now paying income taxes who can afford the best service you have to offer. Your potential quick market for the "Kitchen Kompact" lies with people living with old fashioned kitchens who have an income of \$2,000 and up.

I believe that Mr. Cuthrell had the old houses in his territory in mind when he planned this "Kitchen Kompact." He saw in it, no doubt, a splendid means of tying in with the modernization program of President Hoover. Among the most interested visitors to the Brooklyn Union Gas Co. exhibit, however, were many builders, who asked for prices on a quantity of these "Kitchen Kompacts" for use in new houses. If builders were to install the complete gas kitchen, much of the gas company executive's worry on "losing the cooking load" would be removed.

Whether you merchandise in a territory filled with old houses, where modernization is needed, or you live in a new town, where new building only is your consideration, you will recognize the interest-drawing value of one of the "Kitchen Kompacts." It will bring women into your showroom; it will arouse much comment and serve to advertise and popularize the value of modern gas service. Every merchant on Fifth Avenue, on State Street or on Grant Avenue, when he visits

the foreign market, brings back items which are intended for publicity only—items he does not expect to sell. While this "Kitchen Kompact" does not fall in that class, for it sells itself, it has the same publicity value, the same news value. No department store merchant would permit a new item not to be shown. Its very newness serves its purpose in life.

As a woman merchandiser, it seems to me that Mr. Cuthrell has shown evidence of knowing what women want in kitchen equipment, and he has made it his business to give them what they want in order to gain his own ends,—to popularize the use of gas and increase the use of gas service. It is only a step from this to the "Cellar Compact," a neat arrangement of heater, automatic water heater, and, if you choose, incinerator, in order that the balance of the basement may be made into the modern recreational room. Mr. Cuthrell is not trying to arbitrarily sell people more gas and bigger gas bills, he is trying to meet intelligently an existing need. Giving the people what they want, when they want it, at a reasonable price. He has served well the gas industry in imagination stirring merchandise.

Utility Ad Men to Meet In New York

THE annual convention of the Public Utilities Advertising Association will be held in New York City from June 14 to 16.

It is expected that nearly 200 public utility advertising men from all sections of the country will attend the convention, which will be held in conjunction with the annual gathering of the American Federation of Advertising, of which the public utility group is a department.

J. S. S. Richardson, director of information, Joint Committee of National Utility Associations, is chairman of the program committee, and Keith Clevenger, director of publicity and advertising, American Gas Association, is chairman of the committee on entertainment and arrangements.

A feature of the convention will be the award of prizes for the best public utility advertisements appearing in newspapers during 1930, according to Irving Tuteur, president of the Association. Prizes will also be given for direct mail, billboards, and poster advertising.

McCarter Awards

MORE employees of the Public Service Company of Northern Illinois have been added to the list of recipients of honors for the saving of human life by the Shafer Prone Pressure method of resuscitation, with the awarding at two recent safety meetings of McCarter Medals and Certificates. T. F. Wickord, lineman at Maywood, and Herbert Lee Eimerman, line foreman, were the winners of McCarter Medals and Certificates. J. F. Kropacek, Jr., meter repairman at Maywood, E. P. Fritschell, groundman and Wesley Beach, lineman, received McCarter



T. F. Wickord

Certificates. Wickord and Kropacek were presented their awards by F. P. Elliot, and Eimerman, Fritschell, and Beach were presented theirs by Theodore Blech.

Several of this company's employees are now holders of McCarter Medals. The McCarter awards are the generous donation of Thomas N. McCarter, president of the Public Service Electric and Gas Company of Newark, New Jersey, and they are presented through the American Gas Association.

Wickord and Kropacek saved the life of William Lehnert, May 12 at River Grove. Lehnert had been overcome by gas when his sister found him. She called the police who in turn called company headquarters. In response to the call Mr. Wickord and Mr. Kropacek arrived at the scene and Wickord immediately began application of the Shafer method. He was relieved later by Kropacek and the two took turns until Lehnert was revived. An inhalator was used in connection with the artificial respiration.

Eimerman, Fritschell and Beach saved the life of John Waltari at North Chicago. Waltari, an employee of the North Shore Gas Company, had been overcome by gas while making a tap in a ditch. The three Public Service employees, who were working across the street from Waltari, went to his aid and Eimerman began the application of the Shafer method. He was relieved by Fritschell and later by Beach. At the end of about ten minutes Waltari recovered.



H. L. Eimerman

Bottled Gas Joins the Air Navy

TO picture a gas range being used in an airship requires some stretch of the imagination. To make it easy to visualize, the accompanying illustration shows a range which will be used in just this way.

When the giant United States Navy dirigible Akron, ZRS 4, takes to the air her galley will be fitted with a gas range as modern in its equipment as any range in use in the home. In fact, this range, be-

cause of its environment on the huge craft, embodies features never before included in gas range construction. Never before has gas for cooking been used on aircraft.

The range will use natural gas as a fuel, because the equipment required is lighter than that required for other forms of heat. Propane, one of the richest portions of natural gas, will be purified, compressed into liquefied form and carried in

special light cylinders constructed for this purpose. A fuel supply to permit staying aloft approximately twelve days without landing will be carried.

The requirements were for a heavy duty, large capacity range, yet light in weight because weight is of primary importance on an aircraft. The engineers of the United States Navy and the Goodyear Zeppelin

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Eighth Annual Distribution Conference in Session at Cincinnati.

450 Engineers Attend Distribution Conference

THE Eighth Annual Distribution Conference held in Cincinnati, O., April 8-10, aptly demonstrated the continued interest of distribution engineers in these annual gatherings both from the standpoint of attendance and keen participation in the subjects brought up for consideration. To those in charge of the Conference it was a matter of great satisfaction to note the success attending the first evening session attempted at any of these conferences. An attendance of 450 engineers gave every evidence of a desire to continue the discussion of the extremely technical subject of distribution design as long as the chairman would permit them.

William M. Henderson, of the Los Angeles Gas and Electric Corporation, opened the meeting with a paper on "Distribution Design of Los Angeles Gas and Electric Company," and this was followed by a description of the distribution design system of the Union Gas and Electric Company by E. A. Munyan, and a paper by C. A. Harrison, of Henry L. Doherty & Company, on "Distribution Design in Denver." The Chicago system was described by V. F. Bittner and J. J. Novy, of The Peoples Gas Light and Coke Company. The meeting was closed by C. S. Goldsmith of The Brooklyn Union Gas Company, who commented on the various papers and

By H. W. HARTMAN

Assistant Manager, American Gas Association

the principles underlying design of distribution systems.

Another outstanding feature of the Conference was the inspection trip provided on Wednesday afternoon through the courtesy of the Union Gas and Electric Company; approximately 300 of the delegates attended this trip which included visits to such interesting heating installations as that of the New Netherlands Hotel, the main office building of the Union Gas and Electric Company of Cincinnati, as well as a tour of that gas plant and an exhibit of the distribution equipment used by that Company.

O. S. Hagerman, chairman of the Conference, in his opening remarks on the first day discussed the importance of distribution problems which were confronting the engineers in ever greater variety each year. Distribution of a drier gas, change-over problems, and a trend toward higher pressures was cited.

H. C. Blackwell, president of the Union Gas and Electric Company, extended the welcome to the Conference and paid a high tribute to the usefulness of such meetings.

George Wehrle, of the Public Service Company of Colorado, presented

a truly comprehensive report on behalf of the Committee on Conversion from Manufactured to Natural Gas and Walton Forstall, as chairman of the Committee on Cast-Iron Pipe Standards, reported the adoption of standards for plain-end cast-iron fittings and the standardization of mechanical joints.

The afternoon session of the first day was largely devoted to the work of the Pipe Joints Committee and allied subjects such as arc-welding of steel pipe. This subject has always proved a prolific one from the standpoint of interest and discussion and the session included such well-known speakers as H. W. Battin, of the United Gas Improvement Company, chairman of the Pipe Joints Committee; K. R. Knapp, chief engineer of the A. G. A. Laboratory, and William M. Henderson, of the Los Angeles Gas and Electric Company, who spoke on "Movement of Pipe in Sub-Soil."

F. O. Suffron, who has recently joined the A. G. A. Testing Laboratory staff and has devoted himself directly to the research work on pipe joints, presented a progress report which included the repairing of old joints in service and testing of new joint combinations in large size and a study of vibration of mains due to traffic.

M. R. Simpson, in the absence of H. C. Price, presented his paper on Arc Welding of Steel Pipe.

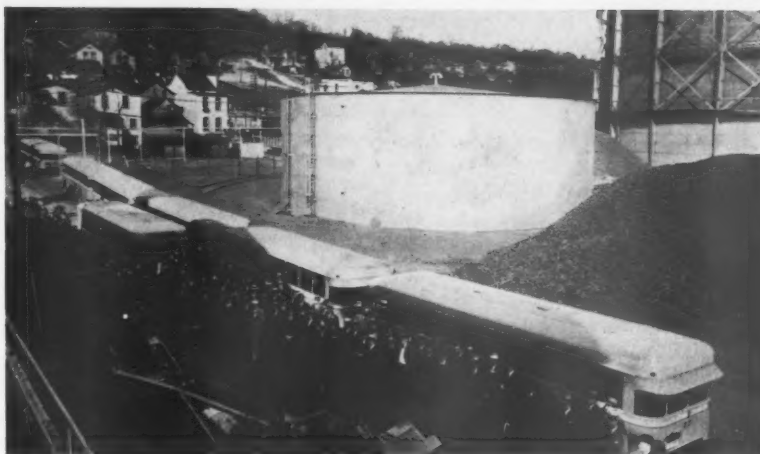
The Thursday morning session was devoted to the subject of pipe coatings and corrosion. J. K. Crowell, of the S. R. Dresser Manufacturing Company, and chairman of the Committee on Pipe Coatings and Corrosion, opened the meeting which included papers on "Soil Corrosion Studies at the Bureau of Standards," by Dr. K. H. Logan, a report on the "Developments in Pipe Coatings Research," by Dr. Scott Ewing, Bureau of Standards, and a "Summary of Progress in Corrosion Research of the A. P. I.," by Dr. Gordon Scott, Bureau of Standards.

O. K. Smith, of the United Light & Power Construction Company, described the experience of that company with pipe coatings in an interesting discourse.

The subject of corrosion cannot be discussed in detail in this brief account, but it might be well to emphasize that Mr. Crowell, in his presentation, announced that the United States Bureau of Soils will be glad to have engineers, experiencing pipe failure, send the Bureau of Soils a sample of the soil closest to the failure, for analysis.

F. A. Lydecker, Public Service Electric and Gas Company, and vice-chairman of the Distribution Committee, presided at the April 10th morning session. The first speaker, J. E. Overbeck, Columbia Engineering and Management Corporation, presented a progress report of the Meters Committee including such subjects as maintaining of proof of large capacity meters; sound practice for testing of displacement type meters with meter provers; recommended practice for reporting meter tests; results obtained by the use and testing of impeller or rotary type meters and several others.

An important subject—"The Effect of Dehydration and Oil Fogging on Meters," was presented by J. E. Spindle, Grand Rapids Gas Light Company; W. E. Kemen, Milwaukee Gas Light Company, presented a paper on "Power Tamping Machines," and A. H. Anderson, Detroit City Gas Company, presented a paper on "Boring Machines of Special Design."



Delegates attending Distribution Conference inspect plant of the Union Gas & Electric Co., in Cincinnati. Two-hundred and fifty made up the inspection party.

The outstanding papers on the last day included the presentation of the "Economics of Butane-Air Systems," by L. J. Willien, Byllesby Engineering and Management Corporation, and a paper on the "Design and Operation of a Butane-Air Plant and Distribution System," by E. L. Fischer, United Light & Power Company.

The session was preceded by a showing of the film of the Columbia Gas and Electric Company depicting the entire process of natural gas production, distribution and sale.

At the meeting of the Advisory Committee of the Distribution Committee held January 9, F. A. Lydecker, of the Public Service Electric and Gas Company, was elected chairman of the Program Committee for the 1932 Dis-

tribution Conference and started immediately on the preparation of details for the next meeting. Mr. Lydecker has acted as vice-chairman of the committee during the present year and has been active in the committee work having to do with high-pressure transmission of gas and other subjects.

A meeting of the Managing Committee was held during the Conference at which plans were laid for the October Convention week.

Appreciation was expressed for the assistance of members of the Union Gas and Electric Company, particularly E. A. Munyan, and his assistant, W. J. Schreiner, who were untiring in their efforts to secure the success of the Conference and the enjoyment of the attending delegates.

Aid Society Assists Company Employees

ALMOST \$475,000 was paid in sick, death, and relief benefits to employees of the Consolidated Gas Company of New York and affiliated gas companies during 1930, according to Colonel John Stilwell, vice-president in charge of industrial relations.

The Gas Companies' Employees' Mutual Aid Society, the organization directly in charge of employee welfare, reported that \$165,161.36 was spent for medical service for employees; \$102,530.15 for sick benefits; \$202,200 for death benefits; and \$5,078 for relief donations, making a total of \$474,969.51.

The amount paid for sick benefits was nearly 25 per cent less for 1930 than for 1929, indicating an improved health condition among employees, Mr. Stilwell said.

Veteran Employees Meet at Philadelphia

TWO hundred and forty members of the Philadelphia Gas Works Company Quarter Century Club attended the first annual meeting and dinner of the club in March at Philadelphia. W. H. Gartley, vice-president of the company, who is a member of the club with more than forty-one years of service, presided.

Eighteen men who had passed the twenty-five year service mark during the year were presented with certificates of membership by Conrad N. Lauer, president of the gas company. Mr. Lauer congratulated the members on their length of service in the operation of the city-owned gas works.

Length of service of the members of the club ranges from twenty-five to more than fifty years.

Analyzing and Securing The Most Profitable Load*

IN our rapidly-growing industry, selling and salesmanship must continue to play an ever-increasing role of importance. Our paths in the departments of production, transmission and distribution are well-charted. Our engineers have been successful in their efforts toward maximum efficiency in production; our operators have brought about savings through their managerial skill. The years which have been spent in exhaustive study and research in all the mechanical processes of our business have resulted in remarkable improvement. But in selling, its methods and plans, we cannot say that this same high stage of development has been reached. Yet it is selling—the commercial department—that is charged with the responsibility of securing the revenue with which to operate, increase, and expand facilities, and to realize a reasonable return on the capital invested.

The first problem of a sales department of any utility is to secure the most valuable business possible for the company. In a recent address in which he discussed most ably "The Economics of Load-Building," Colonel Oscar Fogg, former president of the American Gas Association and now vice-president of the Consolidated Gas Company of New York, sounded what I believe should be the keynote of salesmanship for every gas salesman in America when he said, "It is simply the profitable expansion of our business along sound economic lines." This would make an excellent text for every gas utility sales department.

We will take the term "profitable expansion." When we plan a water heater campaign, a range campaign, a refrigerator campaign, or a campaign for selling any equipment for fuel or heating, whatever the sales

By JAMES F. ORR

effort is to be, we first determine what the results of such a campaign will be in the increase of net revenue, for after all the net revenue is the only standard by which to gauge the value of selling effort. In other words, the sale of an appliance is

Advertising is the Herald

All must appreciate the value of the proper coordination of advertising and sales effort, with the full realization that the one is incomplete without the other—that the one is properly corollary to the other.

merely the means to the end of selling additional gas load at a profit. We have no other justification for the sale of appliances. However, if the appliances we sell do not result in our selling additional load at a profit, it is probable that we have sold the additional load at a loss.

The big problem of profitable expansion is to determine where the greatest expansion can be made, the greatest amount of gas sold. By surveying, analyzing, and classifying our market, we should with reasonable accuracy determine the relative value of each of the various groups of usage, which taken together represent the field of our possible growth. Some factors to be studied are: The condition under which fuel is to be used; the burden imposed upon the production, transmission, and distribution facilities; the extent to which each separate class of business can be taken on without adding to the existing investment, or the amount of added investment necessary to properly care for such business; and the characteristics of fuel demand and its influence upon the economy of production, transmission, and distribution.

A study of this kind will show

that the several classes of potential business have different values when viewed from this practical light, or as we might say, they will take rank in attractiveness or desirability in the order in which they contribute to the net earnings. Why not, therefore, allocate expenditures for promotional work on the basis of relative value to the company of each class of prospective business? Why not construct our rates for each class of potential business with relation to the contribution of each to the net revenue?

In this connection, let me also bring up the third problem—that of salesman's compensation. In line with our idea of relative value, why not compensate the salesman on the basis of the effect his sales efforts have on the company's earnings? As stated before, the whole purpose of our sales activity is to expand the use of gas—at a profit and along sound economic lines. Mere growth in volume sold is not enough. The growth must be orderly, logical, and in accordance with the most efficient and economic production, transmission, and distribution operation.

Once the sales policy and the sales or promotional problems have been determined, the expansion of our business resolves itself into a matter of the best sales methods. Promotional work or selling, aside from its general aspects, which are similar in all lines of selling effort, depends very largely upon the conditions which are to be met in each locality. There are, however, a number of generalities that might be touched upon in this connection.

First, effective selling in our business, as in all others, depends primarily on the highest possible type of salesmanship obtainable. We are selling the most modern, the most efficient, the most economic, clean, and flexible fuel known to mankind. Certainly the type of salesman to

* Address before the Gas Division, Oklahoma Utilities Association, March 11, 1931. Mr. Orr is Commercial Manager, United Gas System, Houston, Texas.

present our commodity and our service proper should, by his training and preparation, his understanding of his industry and its program, and his ability to explain it to his prospective customers, as well as by his personal appearance and deportment, reflect all the advantages of modern gas service.

Second, we must all appreciate the value of the proper coordination of advertising and sales effort, with the full realization that the one is incomplete without the other—that the one is properly corollary to the other. In this phase of the industry's activities, we have a problem that, in the main, differs very little from that of any other type of business. By that I mean our sales effort—and advertising is but the herald, the approach to salesmanship—must be directed to the desires of people—desires for efficiency and profits in industry, meeting the competitor's claim with a better product at equal or possibly less cost, as well as desires for health, for beauty, for comfort, for added hours of leisure, etc., in the home life.

Third, we must never lose sight of the obvious fact that the fundamental basis of successful salesmanship in the utility industry is the maintenance of excellent service at all times and that fully 90 per cent of the appreciation of good service is derived through the courteous, thoughtful, painstaking attitude of the salesman and all other utility employees who come in contact with customers or the public, at all times and under all circumstances. The best of service can become secondary when salesmen, meter readers, cashiers, adjustment clerks, etc., fail in the use of these attributes of successful utility operation and growth. Customers will overlook an occasional defect in the mechanical service if their personal or human contacts are satisfactory—likewise, they will fail to appreciate perfect mechanical service if these human contacts with the industry are unpleasant.

Having before us the problem of how to proceed to make a profitable expansion of our business, let us consider the value of a survey of service facilities as a requisite for

Human Contacts Important

Customers will overlook an occasional defect in the mechanical service if their personal or human contacts are satisfactory.

building a sound sales program. To make such a survey is by no means a small undertaking. It requires thorough preparation and careful execution of a prearranged plan. It requires not only a trained personnel to do the work but also the proper facilities, equipment, and tools.

The *Gas Age-Record* for January 25, 1931, states that the average investment per dollar of gross revenue for the gas industry has advanced steadily from \$5.14 in 1926 to \$5.90 in 1929. One of our properties, confronted with this increased investment cost in relation to our gross, and lacking potential industrial load, was faced with the task of finding a way to develop the residential and commercial use of gas far beyond the average; and, realizing that this type of load offered one outlet for the expansion of our business, we undertook a survey of this class of our service.

After selecting a suitable building and fitting it up with testing and repairing equipment, meters, and appliances to be repaired, etc., we conducted a school for employees. A full week's program was outlined, with a number of speakers from both within and outside the organization.

Every phase of the company's facilities and operations was presented by the company speakers. The instruction started with field operation and carried through the transmission and distribution facilities. Every step of the company's physical set-up for serving was gone into; policies of the company were explained; instruction in the operation of the various equipment and appliances was presented by the representatives of the manufacturers; members of the American Gas Association staff and Testing Laboratory were present and lectured on subjects having direct bearing on the work to be performed.

After this general instruction had been presented, the men were divided into various small groups according to the duties they were to assume and were given specific training under proper supervision. After this more definite instruction, the men had a far better understanding of the aims and objectives of the company, as well as a better appreciation of its problems. We then started a house-to-house canvass. Service lines and house piping were examined. Inspections and minor adjustments were made. A complete record was kept of the use of gas in the home and of the condition of appliances, and the record cards were turned in each day. The desired information was catalogued on customer card files for follow-up work. The results of this survey were entirely satisfactory, and the inspections brought to light existing defects which could be corrected before serious trouble arose. Testing of appliances gave the opportunity of removing the cause of minor irregularities and at the same time the chance of obtaining information on the appliances in use and for follow-up work on replacements or selling new appliances.

From the standpoint of the customers, perhaps the most important result is that they know that their gas company is serious in its efforts to render satisfactory service. In general this survey has helped us in paving the way for building up the most profitable domestic load and in strengthening our customer relations.

Executives must first recognize and appreciate the relative value of the various types of business. When each has been accorded its proper place, when we are well-organized by having a carefully selected, well-trained sales force and service organization thoroughly acquainted with our service and policies, when we have a complete detailed plan to follow and follow it, we can look for a more profitable expansion of our business along sound economic lines, and we will have fulfilled our obligation to our customers, our stockholders, and ourselves.

A. G. A. Course In Employee-Customer Relations

MARK TWAIN'S observation upon the human failure to do anything about the weather in spite of the universal talk about it, needs to be repeated in connection with employee-customer contacts throughout the length and breadth of this business nation—but not for the gas industry. Recognition of the importance of those contacts in determining public attitude toward utilities and other business concerns has become almost universal—theoretically—but it has led to few systematic attempts to train employees for improvement in their handling of customer contacts. The first such effort on a large scale is the Course in Employee-Customer Relations of the American Gas Association.

The work of the Houser organization for many years has been the investigation of public attitudes. This means the inquiry into attitudes of people in general towards hundreds of different concerns, towards various products of these concerns, and towards various policies of many different institutions. We have talked with hundreds of thousands of people concerning things in which they are vitally interested in their daily life. In these talks we have learned not only the general attitude of the public toward specific situations, but also the reasons for that attitude. Reasons, of course, cannot be obtained by asking for them directly. People are not always conscious of their reasons for action or feeling. It is perfectly possible, however, for a competent psychologist to learn something of these reasons by the correlation of various experiences, preferences, likes, and dislikes.

One of the most interesting results of most of our studies has been the confirmation of a thought which seems simply common sense to a great many thoughtful business executives. The one factor which stands out predominantly in influ-

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encing public attitude toward most business concerns is the public reaction toward its treatment by the employees of those concerns. This statement has been verified so repeatedly that it can be made with every confidence in the great majority of situations.

Please note that there is no insistence here that employee treatment of customers is the chief factor in every situation. There are people who are indifferent to the human factor involved. There are people whose attitude toward business is determined very largely by the economic theories which they hold. There are people whose attitude toward business concerns is determined more by their theories of social relationships. There are people whose reactions toward business concerns are determined by religion or by some other little-evident cause of prejudice. These individual cases, however, are not of vital importance. The question is chiefly with regard to the reaction of the majority, or at least of large minorities.

The Course in Employee-Customer Relations of the American Gas Association is planned as the most effective means of carrying on a program which had its inception a great many years ago. It is almost impossible to point out when the importance of employee-customer relations was first recognized. It is equally difficult to point out when the conference method was first used in the training of employees. Many different dates and different individuals are given the credit for the beginning of this work. The important thing is not how the work started, but rather how far it has gone and what it has accomplished.

The Houser organization has been engaged over a period of several

years in the installation of training programs for employees who have direct contact with customers. There have always been difficulties in carrying through any such program. The difficulties are not so much those that might be expected—opposition on the part of the rank and file of the employees to be so trained—but rather opposition among various minor executives who cannot realize the value or the effect of such training.

It happens almost invariably that the real leaders of various business enterprises see only too clearly the need of training to improve such a fundamental feature of their business as the employee handling of customers. Almost invariably, however, it happens also that a very few of the sub-executives feel that such work is entirely unnecessary and that the only possible way to improve customer relations is to select people who will obey orders and to fire those who will not. It would hardly seem necessary to point out the fact that this method of selection and firing has been tried for years with various companies, but has not succeeded.

The greatest difficulty which has been faced, after once getting the program accepted, has been in making the conference leaders of the company realize the necessity of preparing interesting material for their groups. The conference is useless unless the subject is real and vital to the group members' work. If a trained conference leader of ability were placed in charge of every group conference, it might be perfectly possible to work out an effective program lasting through a period of several years and depending entirely for its content upon the experiences of the group members which the leader could get his members to discuss. Unfortunately, most conference programs have to depend upon untrained leaders as well as

those who have had experience. They also have to depend upon individuals who have not and cannot acquire the proper attitude toward the work, as well as upon those who realize its full value. Under such circumstances, it becomes necessary to furnish material which can be used for the members of the group independently of the stimulus and the ability of the conference leader.

To supply this material is the aim of the American Gas Association Course. That it has succeeded in its purpose is evident from the experience which companies all over the country have had in carrying on their programs. Over 5,000 gas company employees are now carrying on their work in this Course. About 1,500 more have already been enrolled for work to begin in September at the latest, and by September there will be at least 1,500 more. I have not the slightest doubt but that this Course will reach a total of over 15,000 employees of gas companies in the United States.

The credit for the idea of this Course in text form belongs not to the Houser organization, but to K. R. Boyes, secretary of the American Gas Association. He had to sell the idea of preparing such a course to us. After we once started upon the work, and particularly after we saw something of the way in which it could actually be used, our enthusiasm grew. At the present time our enthusiasm is almost unlimited. There are very few states in the Union where the Course is not being tried out. It is used on the Pacific coast, as well as the Atlantic coast; in the extreme South, as well as in the extreme North. It is used by the largest companies in the business, as well as by some of the smallest companies. It is used by companies that are extremely wealthy, as well as by companies that are not very strongly financed. The results seem to be the same everywhere—enthusiasm from the rank and file, as well as from the conference leaders and the executives.

The material used in the Course is divided into six units: I. What the Customer Wants; II. The Gas Company's Business; III. Customer Contacts; IV. The Special Jobs; V. Mak-

ing the Business Grow; VI. Every Employee a Salesman. These units are sent to the individuals enrolled at intervals of four weeks or a month as preferred by the company. The purpose of the text is not in any way to limit the discussion to material provided by it, but rather to furnish a basis with illustrative material for discussion of the actual experience which the employees in the group have in their own daily contacts. Throughout the texts an attempt is made to develop the application of the principles to the individual's own work. If the text does not succeed in accomplishing this purpose, it is a flat failure. Actually, the reports coming in by the hundreds from the field emphasize the fact that this Course is accomplishing that very objective.

Any individual reading the texts and working through the problems and questions which are included undoubtedly would be benefited in his handling of customers. The conferences, however, will more than double that value. It is possible for a conference to develop into a mere "gab fest" if the leader is incapable of carrying it on. The conferences may, on the other hand, be the most valuable experience in the employee's "professional life." The chance at self-expression, which most executives get at some time or other during their lives, is too frequently denied to the rank and file of employees. That chance is not simply given, but presented with encouragement for use in the right sort of conferences. The letters which have come to us from gas companies all over the country emphasize the importance to employees of this chance for self-expression.

If conference leaders can be so selected and trained that they will drive themselves to work consistently toward improving their conduct of conferences, the use of the American Gas Association Course can be expected to produce very important results. To help with the growth of the leaders a training manual for their use has been prepared in connection with this Course. The Conference Leaders' Manual is by no means a complete treatise. It is rather a set of suggestions for

lines of growth. It is planned to aid the leader who is carrying on the work.

The real test comes in the results. Those interested in inquiring further into the use of this Course among companies all over the country will find the answer to most of their questions in a booklet—"Training in Friendship," issued by the American Gas Association. Mr. Boyes, secretary of the American Gas Association, will be glad to send one upon request. Any inquiry regarding the Course itself or regarding methods of carrying on the Course will be gladly answered by Mr. Boyes or by the Houser organization. The enrollments and the financial arrangements are made entirely through the American Gas Association. We handle merely the mechanical details of the conduct of the Course. We are especially anxious to do everything in our power to help make this Course effective. We are receiving reports and suggestions every day, and we try to pass the best of these suggestions on to the companies interested. If we can aid in the installation of the program for any company, we are glad to do so. The work represents one of the largest undertakings in employee education to be found in the country. It is a cooperative effort among gas companies which cannot find a parallel in effectiveness anywhere else.

Land Contract to Build Big Pipe Line

Ford, Bacon & Davis, Inc., engineers, have been awarded the contract for construction of the last section of the world's longest natural gas pipe line which extends more than 950 miles from the Texas Panhandle to Chicago. The last or seventh link of this project, running from Rock Island to Joliet, Illinois, will be 155 miles long and the contract provides for its completion on or before July 1.

The seventh section will be made of twenty-four inch pipe, the standard size employed throughout the line, and will cross the Fox River and the Illinois-Mississippi Drainage Canal. At Joliet the line will connect with the Chicago Belt Distribution System which serves greater Chicago and adjoining territory.

Some Recent Trends In Gas Rate Structures

ABOUT a year ago the Statistical Department at American Gas Association Headquarters compiled and issued a pamphlet covering the trend of gas rate structures in the United States

from 1925 to 1930, based on an analysis of Association Rate Lists No. 3 and 8. The conclusions of that study were summarized as indicating for the five year period, first, a more widespread appreciation and use of rates embodying a scientific formulation of fixed cost principles, affording rates which are more equitable to consumers and therefore better adapted to promote the gas business by inducing greater consumption, and second, a more general use of distinct rates for special classes of service, or a trend in the general direction of class rates.

The present study is neither as complete nor as detailed as that outlined above, and covers, in the main, only a one year interval, being based on an analysis of Association Rate Lists No. 8 and 9. Nevertheless it indicates a continuance and increased appreciation of the two major factors enumerated above, that is the more widespread use of rates formulated upon sound economic principles, and a greater recognition of the competitive aspects involved in the construction of rates designed to enlarge the industry's market by the acquisition of such business as house heating, large volume water heating, as well as increasing the use of gas for industrial and commercial purposes generally.

There are two new features of Rate List No. 9 which are especially noteworthy; first, the inclusion of a separate section indicating rates for 73 communities served with butane or butane-air gas, and second



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the inclusion not only of the first therm rate adopted by a gas utility in this country, but also the therm rates which have been adopted in 174 additional towns and communities during the course of the past eight months. Both of these developments will be discussed at more length during the course of this study.

Perhaps the most comprehensive summary of recent trends in gas rate structure is to be found in Table 1, opposite, which shows, for the manufactured gas industry of the United States, a classification of rates according to class of service and type of rate structure in effect on January 1, 1930 and January 1, 1931. It should be noted that the various groupings of rate structures or forms are substantially those embodied in the 1926 report of the American Gas Association Rate Structure Committee entitled "Principles of Rate Making for Gas Companies."

It should be noted that the classification General Service or Domestic Rates refers to the gas companies' basic rate applicable to domestic and in some cases other classes of service as well. Optional domestic rates, particularly those whose availability is dependent on the use of gas-fired water heaters, are given separate treatment in this analysis.

Referring to Table 1, it will be observed from the first column that Class 1 rates for general service or domestic uses have undergone some striking and significant changes during the course of the year. Perhaps the most outstanding feature is that involving straight line rates. Practically all students of the fundamental economics underlying the design and formulation of scientific rate structures are agreed that the straight line type of rate is basically inequitable both to

the consumer and the gas company alike in that it tends to restrict the utilization of all the various services which the company is so well equipped to render to the modern home.

It is distinctly encouraging therefore to observe that the number of straight line rates dropped from 125 in 1930, to 91 in 1931. That is to say some 34 companies abandoned this obsolete type of rate form during the year.

Perhaps a clearer perception of the magnitude of this decline in straight line rate forms for general service or domestic uses may be obtained by expressing the data of Table 1 in percentage form. It will then be noted that in 1930, straight line rate forms still constituted 11.5 per cent of the total number of rates available for domestic service, whereas by 1931, this proportion had dropped to only 8.6 per cent.

It will be observed from Table 1, that the total number of Class 1, that is, General Service or Domestic Rates, dropped from 1084 to 1051, a decrease of 33 during the year. It should perhaps be explained that this was due in large part to the merging of several companies with consequent elimination of separate rate schedules for the merged properties, as well as the transfer of several companies from the manufactured to natural gas classification. In spite of dropping out these 33 situations during the year however, the grand total of rate forms for all classes of service increased from 2122 to 2314, affording striking proof of the increased use of rates for special classes of service previously mentioned.

For example, the number of rates designed especially to secure house heating business increased from 440 to 530. That is to say there were some 90 communities in which special rates for this class of service were inaugurated during the year.

A similar increase may be noted in rates for other special classes of service, such as commercial, industrial and large volume water heating.

TABLE 1
Comparison of Manufactured Gas Rates in Effect on Jan. 1, 1930 and Jan. 1, 1931
Classification of Rates According to Class of Service and Type of Rate Schedule
Manufactured Gas Industry in the United States

Rate Type No.	Type of Rate	CLASSES OF SERVICE											Total Number of Schedules for All Classes of Service								
		Class 1	Class 2	Class 3	Class 4	Class 5 and Industrial Commercial (Wholesale) Rates	Class 6 Water Heating Rates	Class 7 Building Heating Rates	Class 8 House Heating and Industrial Rates	Class 9 Off-Peak Industrial and Commercial Rates	Class 10 Special Domestic Rates	Class 11 Miscellaneous Rates									
		1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930		1931							
1	Straight Line Rate	125	91	133	135	4	9	6	5	6	4	8	5	2	1	0	2	0	0	285	
2	Step Rate	12	11	0	0	6	6	1	1	2	3	0	0	0	0	0	0	0	0	21	
3	Block Rate	473	464	51	53	72	60	10	14	20	16	7	20	11	1	1	2	19	26	671	
4	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Straight Line Form	23	31	15	17	2	1	0	2	3	2	1	2	4	1	0	0	6	9	0	
5	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Block Form	300	314	26	46	13	8	12	13	15	32	6	10	1	5	5	4	2	3	14	
6	Service Charge plus Straight Line Consumption Charge	41	46	14	23	1	6	0	1	0	0	2	5	1	1	0	0	2	1	1	
7	Service Charge plus Block Consumption Charge	14	11	20	65	14	15	1	2	5	10	9	8	1	1	0	0	2	28	0	
8	Service Charge plus Step Consumption Charge	18	9	125	142	73	89	16	13	0	0	0	0	0	0	0	0	0	9	0	
9	Two Part Demand Rate	14	9	39	36	23	31	3	17	13	0	2	15	2	2	2	2	2	9	0	
10	Three Part Demand Rate	3	4	17	9	21	25	2	1	0	13	2	1	0	1	1	1	0	0	0	
11	Flat Demand and Miscellaneous Rates	0	0	0	4	0	0	0	0	1	5	2(a)	2(a)	1	0	0	0	22	40	0	
																			1(c)	0	
																				4	
																				81	
																				11	
																				2314	
GRAND TOTAL		1084	1051	440	530	231	251	31	58	118	165	55	56	35	29	16	11	10	17	76	146
																				6	0
																				2122	2314

(a) Flat rates based on demand. (b) Garage heater rates. (c) Flat monthly charge for gas refrigerator.

NOTE.—In some cases the special domestic rates are based on Class 1 rates. In all cases these special domestic rates apply to the entire gas consumption of customers taking service under these schedules.

TABLE 2
Comparison of Natural Gas Rates in Effect on Jan. 1, 1930 and Jan. 1, 1931
Classification of Rates According to Class of Service and Type of Rate Schedule
Natural Gas Industry in the United States

CLASSES OF SERVICE																			
Rate Type [No.	Type of Rate	Class 1		Class 2		Class 3		Class 4		Class 5		Class 7		Class 9		Class 10		Total Number of Schedules for All Classes of Service	
		General Service or Domestic Rates		House Heating Rates		Industrial Rates		Commercial Rates		Industrial Commercial (Wholesale) Rates		Building Heating Rates		Off-Peak Industrial and Commercial Rates		Special Domestic Rates*			
		1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931		
1	Straight Line Rate	302	339	3	9	120	187	10	12	9	4	3	6	0	6	0	0	447	563
2	Step Rate	5	5	0	0	13	10	0	0	0	0	0	0	0	0	0	0	18	15
3	Block Rate	335	361	4	4	245	307	29	42	14	14	30	45	1	1	0	0	657	774
4	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Straight Line Form	59	98	0	2	4	4	0	0	0	0	0	0	0	0	0	0	63	104
5	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Block Form	85	171	3	8	7	20	0	0	4	4	1	2	0	0	0	0	100	205
6	Service Charge plus Straight Line Consumption Charge	59	72	0	0	9	17	0	0	0	0	0	0	0	0	0	0	68	89
7	Service Charge plus Block Consumption Charge	38	57	0	0	12	9	4	17	0	0	2	19	0	0	0	0	56	102
8	Service Charge plus Step Consumption Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10
9	Two Part Demand Rate	3	7	2	2	9	25	3	7	3	0	5	15	0	1	0	0	25	40
10	Three Part Demand Rate	7	8	0	6	7	0	8	3	0	0	0	0	0	0	0	0	16	23
11	Flat Rate	2	2	0	0	0	0	1	6	0	0	0	1	0	0	0	0	1	1
		0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	3
GRAND TOTAL		895	1122	12	25	425	587	47	93	33	22	41	88	0	8	0	1	1453	1946

*This special domestic rate is available only to customers using gas for water heating and applies to entire consumption of customers served under this schedule.

Another striking feature of the data of Table 1 is the great increase in Class 10, or special domestic rates, which nearly doubled during the year. Practically all of these rates are optional to the regular domestic rate, and are usually available only to those consumers who have installed gas water heaters, or in some case gas refrigerators. Under this type of rate, service is rendered through one meter, and covers other domestic uses as well as water heating or refrigeration, and the rate level is of course substantially lower than the regular domestic rate to which this class of rate is optional.

It is of great significance to note that for general service or domestic uses, almost the only type of rate forms that showed increases during the year were those of the promotional type embodying sound principles of rate economics.

There was a gain of 14 in the number of rates consisting of small initial block constituting minimum bill and block commodity charge. This rate form, called Type 5, usually consists of say a charge of \$1 for the first 200 cubic feet or less per month, with a blocked commodity charge.

The next largest gain was registered in a rate type essentially similar to the above, having the same minimum bill provisions, except that the commodity charge was of the straight line type. Eight new rates of this type were inaugurated during the year, while the number of straight service charge rates with straight line commodity charge increased by 5.

It is also noteworthy that the number of two and three part demand rates applicable to domestic service declined materially, indicating a clearer perception that as far as the average consumer is concerned, the complexity of this rate form renders it unsuitable for domestic service.

It appears that block rates still constitute the largest proportion of domestic rates, aggregating 44 per cent of the total. The marked improvement in gas utility rate structures is indicated by the fact that the next largest proportion, nearly 30 per cent of the total, consist of the Type 5 rates, that is, say, \$1 for the first 200 cubic feet or less with blocked commodity charge. Perhaps a clear indication of this improved trend of rate structures is in-

dicated by the fact that in 1930 promotional rate forms, that is Types 4, 5, 6 and 7, embracing both service charge rates and those with minimum bill covering a small consumption block, aggregated about 40 per cent of the total domestic rates, while in 1931, this proportion had risen to 44 per cent.

The data on house heating rates might be summarized as indicating a trend toward simplification in house heating rate structures. It will be observed that Type 7, which showed the largest increase amounting to 45 new rates of this form during the year, consists merely of a service charge plus block consumption charge, while there were 20 new rates of Type 5, consisting of minimum bill covering small consumption block and blocked commodity charge, inaugurated during the year.

There were also 17 new house heating rates of Type 9, or two part demand rates, inaugurated during the year, and it is of interest to note that this type of rate became the most predominating form during the year. In 1930, straight line rates (Type 1) constituted 30.2 per cent of the total number of house heating schedules, while two part demand rates were 28.4 per cent of the total. In 1931 however, straight line rates were only 25.5 per cent of the total, while two part demand rates constituted nearly 27 per cent of the total number of house heating rate schedules.

An analysis of industrial gas rates, indicates that there was a distinct trend toward the use of two and three part demand rates for this class of service.

At present there are 33 states where distinct service charge rates are in effect. In addition to these 33 states with distinct service charge rates, there are 13 other states where rates of Types 4 and 5 are effective, giving a total of 46 states which have approved and made effective the use of promotional rate forms for general service or domestic uses.

Thus far this study has been concerned primarily with the trend of manufactured gas rate schedules. In Table 2, however, will be found a similar analysis of the trend of natural gas rate structures from 1930 to 1931. In general this table may be summarized along the lines indicated for

the manufactured rates, namely a rapid increase in the adoption of promotional rate forms, together with an increase trend toward the adoption of distinct rates for special classes of service.

From the bottom line of Table 2, it appears that the number of general service or domestic rates increased from 895 to 1122, representing 227 new situations served with natural gas during the year. While some of this was the result of companies changing from manufactured to natural gas by far the largest proportion resulted from the construction and expansion of long distance pipe lines and the consequent extension of gas mains into many communities where such service has not previously been available.

In natural gas territories the number of special rates for house heating and commercial uses is relatively small, owing to the fact that in most instances such uses are included under the general service rate. The increase in the number of special industrial rates is quite pronounced, however, rising from 425 in 1930 to 587 in 1931, representing an increase of 162 industrial rate schedules inaugurated during the year.

It will be noted that while straight line and block rates together still constitute over 60 per cent of the total number of domestic schedules, the most marked increase during the year occurred in rate structures of a distinctly promotional form, such as Types 4 and 5 in which there was an increase of 39 and 86 rate schedules respectively.

Most of the industrial rates for natural gas are of block form, this type accounting for 52 per cent of the total. The next largest group of schedules are of straight line form, this type aggregating nearly 32 per cent of the total industrial rate schedules. In other words, the use of two and three part demand rates for industrial gas has as yet made little progress in natural gas territory.

Service charge rates for natural gas are effective in 16 states, and in addition to straight service share rates as such, other promotional rates like Types 4 and 5 are effective in 9 other states. That is to say, there are 25 states where natural gas is sold for

domestic uses under some form of promotional rate structure.

It was mentioned at the beginning of this study that one of the new features of Rate List No. 9, was the inclusion of a separate section showing rates for 73 communities served with butane or butane-air gas.

The most striking feature of these data would seem to be that out of a total of 73 rates for general service or domestic uses, 48 of these schedules, or about 66 per cent of the total are of the promotional form designated as Type 5, with minimum bill covering a small consumption block and blocked commodity charge. In addition, 11 of these domestic service schedules, or about 15 per cent of the total, consist of service charge rates with block consumption charge, indicating that over 80 per cent of the general service or domestic rates for communities supplied with butane or butane-air gas plants are promotional in form.

The last year witnessed the adoption in August, 1930, by the second largest gas company in America, The Peoples Gas Light & Coke Company of Chicago, of the therm basis of billing its customers. Since that time 6 other companies, serving 174 cities and towns in various sections of the country, have adopted this therm method of billing.

An analysis of therm rates now in effect, indicates that there are 18 communities in which the general service or domestic rates are based on therms or thermal units, while there are some 170 cities or towns in which therm rates are in effect for classes of service other than domestic or general service uses.

Perhaps the most striking feature of the data on therm rates is the lack of any sort of uniformity as to the billing unit. A study of the billing units indicates that one of the companies does not use the therm itself as the billing unit but instead employs units of 100,000 B.t.u. In addition, this company bases the demand charge on cubic feet.

Bottled Gas Joins the Air Navy

(Continued from page 205)

Corporation of Akron, Ohio, placed a maximum of 110 pounds on the weight of the stove. To secure this

unusually low weight, it was necessary to resort to metals not ordinarily used in gas range construction. Cast and sheet aluminum predominate. In lesser proportions other metals were used, including chromium plated steel, nichrome, stainless steel, magnesium, cast iron and bronze.

A few of the noteworthy features of construction will be interesting. The range is flame-proof and has no open flames exposed to the air of the galley. The air for the burners enters through flameproof gauze which excludes the flame from the galley itself. The two large ovens of the range are thermostatically controlled so that a predetermined heat may be maintained. The top of the stove is solid cast aluminum with iron plates directly above the burners. Each top burner is provided with a flueway so that from front to rear the entire top of the stove is hot enough for cooking purposes. On the left section of the stove is a compartment which holds two large stock pots for use in preparing large quantities of food and keeping them heated and ready to serve.

The range has a capacity sufficient to feed the crew of the dirigible, which will be as many as fifty men. When it is realized that this giant airship is 785 feet long, 132 feet in diameter and has a cruising radius of about 14,000 miles, with a speed of eighty-three miles per hour, it will be clear that the task of feeding the members of the crew is a great and most important one and requires a range of large possibilities.

This range is being built by The Tappan Stove Company at Mansfield, Ohio.

A. G. A. Research in Bright Annealing Metals

(Continued from page 201)

that when a metal has been annealed so as to have a bright surface without subsequent pickling, that surface will remain bright much longer in the ordinary atmosphere than one which has had to be pickled. This fact has been demonstrated time and

again and is of very great importance from a practical standpoint.

There are shown in the illustrations a couple of gas furnaces developed and built by the Surface Combustion Corporation as part of the American Gas Association annealing research, that are being successfully used for bright annealing metals. The material comes from each of these furnaces with a brilliant finish and requires no subsequent treatment of any kind previous to use. One furnace is adapted for the annealing of brass shapes, stampings, etc., while another is adapted particularly to the strand annealing of metals. Other gas furnaces for bright annealing wire have been perfected.

The demand on the part of industry for metals that are bright when they come from the annealing furnace is very well founded. The efforts that have been made to meet this demand have been very thorough-going and exhaustive. A complete study has been made of the entire field and processes developed that have a wide range of applicability.

Arizona Utilities Association

THE annual convention in Phoenix, Arizona, April 9 to 11, proved to be the most successful ever held by the Arizona Utilities Association. The attendance showed a splendid increase, the papers presented were of high calibre, and the entertainment features enjoyable.

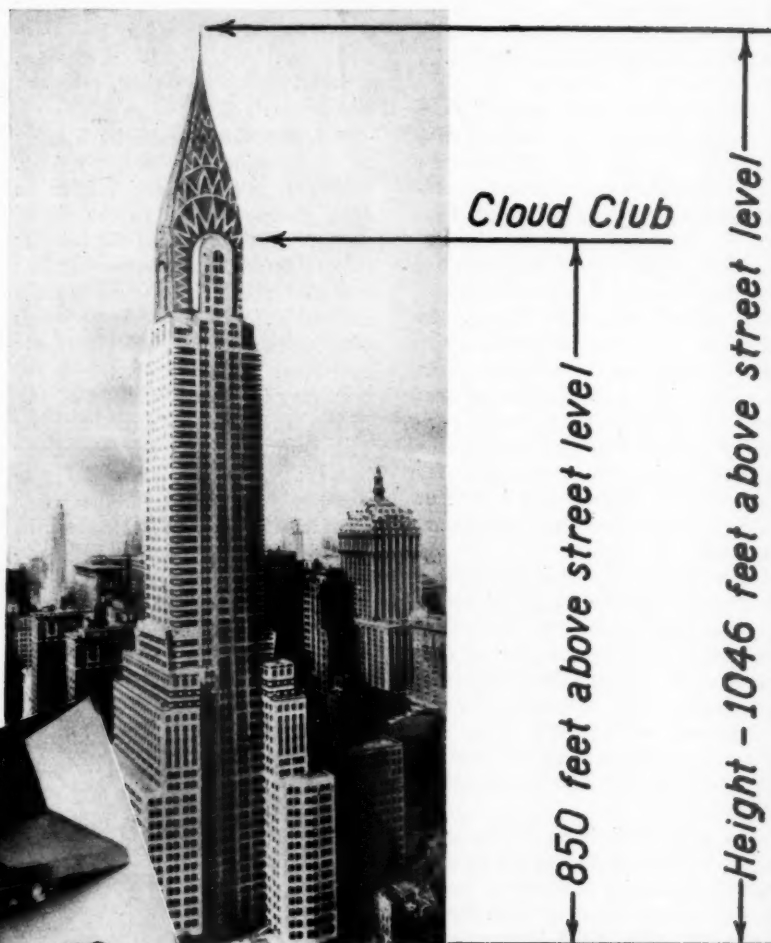
In his address President A. F. Moriarty said:

"During the past year Arizona utilities completed further construction programs and vastly improved their service. Several companies even announced rate reductions. Reports from some member companies indicate that they had a lesser increase in business this year and others show an even greater increase than that of last year. While the flow of business was somewhat deranged, nevertheless I find the conviction that the depression has spent itself and that the recovery, while yet gradual, has already set in. Plans for the future and budgets for the coming year and thereafter reflect that Arizona will again, as it has in the past, set a more rapid pace of development than that of many other parts of the country."

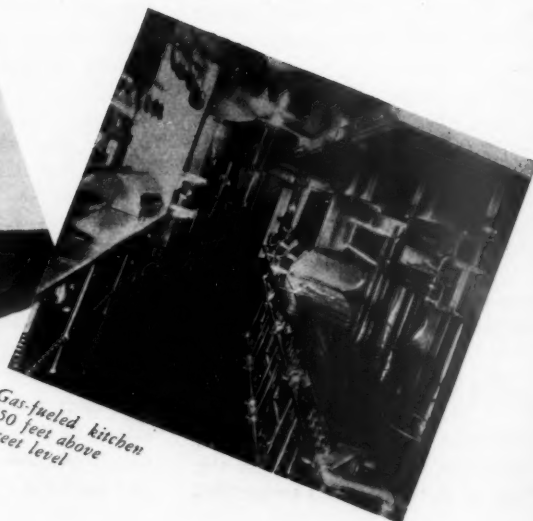
The American Gas Association was represented at this Convention by H. L. Aller of the Electric Bond & Share Co., New York, N. Y., who addressed the gathering.

Cooking By Gas In the Clouds

THE Chrysler Building in New York City, one of the world's highest structures, towering 1046 feet above the street level, is supplied throughout with modern gas. Located on the sixty-sixth, sixty-seventh, and sixty-eighth floors of this building, 850 feet above the street, is the luxurious Cloud Club, one of the most unique gas cooking installations of its kind in the world.



*Cloud Club Bake Shop
showing one of the
gas-fired ovens*



*Gas-fueled kitchen
850 feet above
street level*

Factors Governing Baking Results In Gas Ranges*

Walter Gifford, the present president of the American Telephone and Telegraph Company, has said, "Readjustment is the price of progress." With our changing and constantly improving household equipment, which is most certainly progress, we must make a number of readjustments. We must, because we are the leaders in the field, teach these readjustments which, through lack of opportunity, all homemakers do not know how to make for themselves.

It has also been said, "Man must not only discover natural laws, but man must adapt scientific discoveries and developments which, if put to practical use, will contribute in material ways to our daily comfort and well-being."

Perhaps the first thing that we, as home service directors, must do is to recognize those scientific discoveries and developments. This means diligence in seeking for the latest advances in machinery, equipment, methods of work and in food products. We must discriminate as to those which will be helpful and those which will but add extra burdens to the woman who quite often has more than she can already attend to in these days of complex living.

We must learn where to go for our information. Its worth can be evaluated partly by judging the source of the information, as to whether it is reliable or not; whether it is authentic or not; whether the agency which is responsible for the information is giving an unbiased opinion. We need sometimes to readjust our habits of work and must be willing to make changes whenever the situation demands this for increased efficiency.



Dorothy E. Shank

By DOROTHY E. SHANK

Director, Research Kitchen,
American Stove Company

Cooking is the application of heat to food. We have been aware of this fact for a long time. We should not be satisfied with this definition as it is too general. It should be broken into the various processes of cookery. Let us start with baking. Baking is the application of heat to food by convection of heated air; by radiation of heat from the walls of the oven, and by the conduction of heat from the pans in which the food is being baked.

Conduction is the transfer of heat between two bodies or parts of a body which touch each other. Internal conduction takes place between the parts of one continuous body, and external conduction through the surface of contact of a pair of distinct bodies.

The rate at which conduction, whether internal or external, goes on, being proportional to the area of the section or surface through which it takes place, may be expressed in thermal units per square foot of area per hour. Internal conduction varies with the heat conductivity, which depends upon the nature of the substance.

The rate of external conduction through the bounding surface between a solid body and a fluid is approximately proportional to the difference of temperature when that is small, but when that difference is considerable, the rate of conduction increases faster than the simple ratio of that difference, according to Rankine.

Convection, or carrying of heat, means the transfer and diffusion of the heat in a fluid mass by means of motion of the particles of that mass. The conduction of heat through a stagnant mass of fluid is very slow in liquids, and almost, if not wholly, inappreciable in gases. It is only by the continual circulation of the particles of the fluid that uniformity of temperature can be maintained in the fluid mass or heat trans-

ferred between the fluid mass and a solid body.

Radiation takes place between bodies at all distances apart and follows the rays for the radiation of light. These heat rays proceed in straight lines and the rate at which a hotter body radiates heat and a colder body absorbs heat depends on the state of the surface of the bodies as well as on their temperatures.

How does the food absorb heat; at what rate; is this rate the same for all kinds of food, or does it differ for masses of widely different character? We soon become aware of the multiplicity of problems which are as yet unknown to us and the answers which we must have to be able to teach intelligently women in the homes the most desirable methods to employ in their cooking problems.

Does the pan have an effect on the rate of heat absorption? Will any one food absorb heat differently, depending on the kind of heat that is imparted to it? Does the surface exposure have an effect on this rate of absorption? Many of these questions are as yet unanswered, for we are only just becoming aware of their importance, but some of the following information may open the field and pave the way for additional work.

Modern cookery today takes into account not only time and temperature cooking and tested recipes, but recipes which are built to order. Today our recipes are developed not only by using accurate measurements but also by selecting proper proportion of ingredients, stating clearly and concisely the directions for combining, thereby reducing the possibility of unreliable results to a minimum. Wherever possible we should state the brands and grades of ingredients which are to be used in the recipe, as well as the material of which the baking utensil should be made and its dimensions, because baking results are dependent to a large extent on each or all of these factors.

*Address before Home Service Committee Conference, American Gas Association, Chicago, Ill., March 26, 1931.

As an illustration of some of these points, let us start with the physical factors first. Here is a stove which, because of the way it is constructed, provides in its oven circulating heated air with very little radiation of heat. The heat is radiated largely in to the room from the walls of the oven, and possibly only a small amount radiated to the food which is baking inside of the oven. It has a given cubic feet of oven capacity which is filled with this circulating heated air.

Stove Construction: Or, again, there is another stove constructed in a somewhat different manner which provides a certain amount of circulating heated air, and, in addition, radiates heat from the walls of the oven which have absorbed more heat due possibly to insulating material which is present in its walls.

Effects of heat on glass: Suppose in the oven where we have radiated heat as well as circulating heated air we place a glass baking dish. I am quoting from a monograph, "Glass Characteristics," by Dr. E. C. Sullivan: "A property of glass which is of advantage in baking dishes is its low power of reflecting radiated heat, which results in glass dishes baking faster than metal dishes. The surface of a metal dish throws back by reflection most of the heat rays striking it in the oven, whereas glass reflects not over 10 per cent. The high reflecting power of the metal slows down the heating of its contents to an extent not compensated by its thinness and high conductivity.

"In a test made in Corning Glass Works laboratory, a tin dish took up in a gas oven 50 per cent, in a coal oven 31 per cent, as much heat as a glass dish. An aluminum dish took up in a gas oven 66 per cent, in a coal oven 52 per cent as much heat as glass. Baking in an aluminum dish actually took place more rapidly when a glass plate was put under it.

"Experiments made to compare the saving in fuel accomplished by the use of glass showed that tin used about half more than glass. An accurate gas meter was employed in this test and a pressure regulator was put in the line to further insure a true comparison. In a coal oven or an electric oven the difference in favor of glass would be still greater.

"Although heating takes place more rapidly, yet cooling takes place more slowly in glass than in metal. The cooling of a dish taken from the oven involves smaller temperature differences than the heating and the determining factor is not radiation but conduction. Glass conducts heat about one-hundredth as fast as metal, and the greater thickness of the glass dish also impedes cooling. The glass dish, therefore, is better for keeping food hot."

If, then, oven glass dishes have a low reflective power for radiated heat, it must mean that they absorb radiated heat faster than metal dishes. Therefore, if this line of reasoning is correct, a glass dish should produce a different baking result when used in an oven which produces more radiated heat than an oven which does not.

By the same line of reasoning, the dishes made of glass, which conduct heat only about .001 as fast as metal would not be affected as quickly in an oven which did not produce a fair amount of radiated heat. Here, then, we find a chance for a fairly wide discrepancy in baking results. However, the differences in the resulting products might be affected by other factors which would be as variable from time to time, such as the mass of food material which is being baked in the dish; the grade of ingredients which are used, as well as the proportions of each ingredient. In the case of the two ovens previously referred to, the temperature being the same, the main difference in the result would be due to the difference in the rate of absorption of heat by the pans and, therefore, the rate at which it gives heat to the product being baked in it. The rate of absorption, therefore, may be dependent on the kind of heat or the material of which the pans are made.

Effects of heat on metals: Some metals have more reflective power than others. Of the materials commonly used for baking utensils, polished steel has 83 per cent reflective power and tin 85 per cent. Other figures were not found to give the relative reflective power of aluminum and stainless steel, and other materials commonly used for household purposes.

In an experiment conducted in our Research Kitchen we were interested to determine the practical results of baking on pans made of different ma-

terials. For this work six inch squares of 22 gauge metal were secured. The squares were made of aluminum, unpolished steel, stainless steel, tin, and two squares of steel, one coated with a ground coat of enamel and the other with a white enamel. A standard cooky recipe was used because this particular recipe contains a great deal of fat and a high proportion of sugar, both of which products are quickly affected by heat. They have a comparatively large surface which comes in direct contact with the metal on which they are baked, the heat from which would be absorbed directly to the products.

Instead of rolling the dough, it was put through a cooky press to eliminate the variability of thickness and amount of flour, which, due to rolling, would cling to the cooky dough. The amount of dough which came through the cooky press was as uniform as possible. These cookies were baked four on each metal square in the same position in the same oven at the same temperatures at different times. The oven temperature, of course, was maintained constant by means of a Lorain Oven Heat Regulator. The length of time for baking them was measured by a stop watch. All cookies were thus subjected to as nearly the same baking conditions as it was possible for us to do with the exception of the pans on which they were baked. Illustrations of this test are on exhibit for your inspection.

In this experiment color is the determining factor. It will be noticed, on looking at this series of baking, that those cookies which came in contact with polished surfaces are slightly lighter in color than those baked on the one unpolished surface. It will likewise be observed that those baked on the enamel squares are darker than those baked on the other squares having reflective surfaces.

Enamel, as we all know, is glass and, therefore, has a different amount of heat absorption than the metals. The resulting difference in color of the cookies is not due so much to dark and light materials as to reflective and non-reflective surfaces. If the baking difference were due to dark and light color alone there would be a color difference between the cookies baked on the dark and on the light enamel

squares. It will be observed there is comparatively little difference in the color of the cookies baked on the two enamel pans. Both of the enamel pans have reflective surfaces but the coating which comes in contact with the cooky is not metal and, therefore, a different result can be expected than on the rest of the pans, which are metal. Those cookies baked on the lighter of the two steel sheets with their non-reflective surfaces are lighter not only on the bottom but on the top as well, than those baked on the darker steel square. It will, therefore, be seen that our utensils are important in considering standards of baking results not only because of the fact that they are dark or light, but because they are reflective or non-reflective, and because they are of materials of different heat absorbing efficiencies. This difference in reflective power and heat absorbing power would likely be true for other baking ware the same as it is for pans, so in baking cakes; in casserole cookery, or in roasting, these factors would help to determine the final color of the products regardless of the fact that the same temperature would have been used for any one of these conditions.

From the above experiment it looks as though, for certain types of baking where a deep and heavy crust is desired, pans which produce deeper color would be preferable. Where a thin and delicate crust is desired pans which produce a lighter color in the resulting product should be used. Also, the length of baking time would influence the choice of material of which the utensils are made. Pans which absorb heat slowly and radiate heat slowly are desirable for long or slow cooking processes.

Position of Pans in Oven: Other physical factors which might have an influence on baking is the position of the pans in the oven. After the oven has been heated to the desired temperature and a product is put in for baking, the circulation of heat can be changed or deflected by the pans, depending on the way they are placed in relation to one another. If pans are placed one directly over another heat is baffled to a certain extent depending on the amount of space these pans take in the oven. If, however, pans are placed in alternating positions the

heat of the oven has a fairer chance to circulate between them. We have noted conditions where pans have been placed so close together even though no pan is directly over another, where, due to the fact that the sides of the pans radiate heat to each other, excess browning takes place near the edges of the pans. If, instead of placing two pans close together, a pan is placed so that it covers the space between the two pans, thereby eliminating the possibility of radiation from one pan to another, the baking will be uniform. If pans are so large that there is practically no space between them and the sides of the oven, then baking will not take place evenly on two shelves at the same time.

To illustrate: If two cooky sheets are placed in the oven at one time and they are so large that there is no opportunity for heat to circulate around them, the sheet on the lower shelf prevents the heat from circulating properly on the top shelf. Products baked on the cooky sheets will not be as evenly baked as though one sheet had been used at a time.

Size and Shape of Pans: Another physical factor which affects the baking of products is the size and shape of the pan in which the product is baked in relation to the amount of food being baked. As an illustration of this point, we are all aware of the fact that too much batter for the size of the pan does not produce a satisfactory result any more than too small an amount of batter for the size of the pan in cake baking. We may not use the same temperature or bake the batter for the same length of time every time it is baked, depending on its depth in the pan. If the same amount of batter is baked in a long, shallow pan we will not get the same results as though it were baked in a deeper and smaller pan. The same recipe baked in a tube pan will require a different time for baking than if baked in a straight loaf pan. With a tube in the center of the pan heat can be distributed more quickly and possibly more evenly to the center of the cake, which would be an advantage in certain recipes.

Effect of Atmospheric Pressure: It has been recognized for a long time that atmospheric pressure makes a great difference in baking qualities of

products. People who have gone from sea level or less than 2,000 feet altitude to an altitude of 4,000 or 5,000 feet have often experienced dismal failures with their favorite cake recipes. The reason is that the pressure of air becomes lighter as we ascend to a higher altitude, and the relation of atmospheric pressure to the formation and expansion of gases produced by leavening agents are of the utmost importance. This fact has been notable for many years.

Very little special information has been available on this subject to help those women who have been troubled by this fact. Only recently has a bulletin been issued containing a detailed report, "Baking Flour Mixtures at High Altitudes." This bulletin is published by The Colorado Agricultural College, Colorado Experiment Station, Fort Collins, Colorado, and written by Marjorie W. Peterson. It contains an elaborate description of the factors involved; the laboratory used, and a report of the experiments and observations made. It also contains recipes which are printed for use by the home maker at various altitudes. This bulletin is too comprehensive and too new, having only reached my desk on March 23, for me to give the conclusions reached.

Effect of Humidity on Baking Results: Some time ago the question arose as to whether the time would ever come when women would change their baking habits with changes in the atmospheric humidity. An experiment was undertaken in our Research Kitchen, lasting through a period of over a year. This period was selected because it would give us an opportunity for making tests on days when the relative humidity would be well above or well below average.

For these tests "sunshine cake" was selected as the determining product. One of the first obstacles to this work was the fact that the room humidity on most days was within the normal range. This is probably due to the fact that the average home, especially the kitchen, seems to be within the normal limits. We were not able to control the humidity in our kitchen but we were testing for practical information to determine whether outside conditions would influence baking results. Stoves of three differ-

ent types were used for this experiment.

In standardizing our recipe for "sunshine cake" we digressed a bit from the original problem to determine the best method for mixing this cake. It was found that the best results were obtained when about one-third of the beaten egg whites, to which the cream of tartar and salt and sugar had been added, were added to the beaten egg yolks before folding in the flour. When these were thoroughly blended by folding together, the remaining egg whites were added and the flour was folded in last.

As a result of the test there seemed to be more difference, which was very minor, in cakes baked in the different stoves than in those baked on days when the humidity varied from either very high or very low. This has lead us to believe that in the average home there are more variations in mixing and in amounts and brands of material measured than in the effect of different humidities.

Some of the chemical factors which need to be considered for variability in baking results are: the chemistry of the food which is to be baked, and its composition. This shows notably in flours milled in different localities and of different grades; in different brands of baking powder; different kinds of fat; different cuts of meat, as well as the amount and proportion of the ingredients and materials which are used in the baking processes. These factors can be illustrated by specific examples.

Flour: Let us consider the question of flour first. Different localities have local brands often marketed in the section in which the flour is milled. Various state universities have worked on problems so that they may give recipes and instructions for the use of the type of flour milled in that particular section of the country, thus giving the homemakers proper proportions of other ingredients to combine with the flour of a particular brand. These proportions would be different for a soft wheat than they would be for a hard wheat flour to produce a satisfactory loaf of bread. We know that all types of flour do not produce the same results with a given recipe. That is, hard wheat flour and soft wheat flour produce bread very differ-

ent in character with any given recipe. By changing the proportion of ingredients and possibly the manipulation it is possible to make satisfactory bread from soft wheat. This has been accomplished in localities in the south where soft wheat is grown, milled and used locally.

Baking powder: Different types of baking powders produce different characteristics in any given product, providing all of the other ingredients in weight, measure, kind and manipulation are the same. Also, as can be seen from the muffins on exhibit, different amounts of any one kind of baking powder produces not only differences in volume but differences in color of the resulting product. The more baking powder that is used, the browner the product.

Fat: Different kinds of fat are also responsible for differences in baking results. Fats have different cracking points, or the point at which they decompose. Also, the color of a product, as well as the flavor, is influenced by the kind of fat that is used in a given recipe. Of course, the amount of fat makes a difference in the color and in the texture of the product as well.

The small pastry circles in the exhibit illustrate three different types of flour used with one type of fat, showing the color and texture difference obtained when using these different brands. Also, one of the pastry circles shows the color difference obtained when butter is used instead of the hydrogenated vegetable fat used in the other three. Comparing the one which contains butter with the same brand of flour in which the hydrogenated fat is used, this color difference will be apparent.

Meat: The same principles hold true in other types of oven cookery as for bakery products. If we are interested to experiment in roasting any one kind of meat we will find it difficult to get two cuts exactly the same. Therefore, we have found in our work that it is hard to know, even though maximum thermometers have been used to determine the internal temperature of the meat, just how long it will take to roast the meat to any given internal temperature. The variation will depend on the weight of the cut; the surface exposure of the

meat; amount and distribution of fat; amount and distribution of bone; length and thickness of the fibres, as well as on the grade of meat which is under test.

Proportion of Ingredients: The chemistry of food teaches us that flour provides the gluten which, when baking, gives structure to the product. Egg also is an aid here by virtue of its toughening effect. In addition, it provides a small amount of liquid and is an emulsifier. Because egg contains these qualities, the larger number that are used the greater the amount of fat which may be used with it. Also, air may be incorporated in the egg. Therefore, the amount of leavening will vary with the amount of egg. Sugar is used to give tenderness and make the product more palatable. It also counteracts the toughness of the egg.

It is important that we pay attention to the proportion of ingredients in our recipes for the reasons that have been stated above. The satisfaction of the recipe is dependent on a proper relationship of other ingredients after the amount of flour and egg have been determined.

Manipulation: In discussing food it is difficult to separate the composition entirely from the manipulation and proportion of ingredients. Therefore, while these are not strictly speaking chemical factors, they have been included under that heading for the purpose of continuity.

Manipulation is also an important factor in cake making. Here we have ingredients which produce, when blended, an emulsion that we call a batter. Therefore, any manipulation which forms a more perfect emulsion than another is the best technique for cake making. It is for this reason that directions should read, "Cream the butter thoroughly, or other fat if it has been substituted for butter, and add the sugar gradually."

Many of our dough mixtures have colloidal properties and we must eventually learn how such substances react within their own mass and how they are affected by heat.

We are only beginning to scratch the surface of problems involving the ability of the food mass being baked in the oven to absorb heat.

Affiliated Association Activities

Pacific Coast Gas Association

THE 38th annual convention of the Pacific Coast Gas Association will be held in San Francisco August 31, to September 5, 1931.

Owing to the great possibilities in developing additional gas load in the San Francisco Bay area because of the recent introduction of natural gas, the association will hold in connection with its convention this year a gas industry exposition. The primary purpose of this exposition will be to give the people of San Francisco and neighboring cities an opportunity to view the latest gas appliances in action. The committee in charge confidently expects by intensive advertising and publicity to attract more than 200,000 people to the exposition which will be held in the San Francisco civic auditorium. All meetings of the association also will be held in this auditorium.

All plans for the convention are in charge of R. E. Fisher, president of the Pacific Coast Gas Association, with John P. Coghlan, second vice-president of the Pacific Gas and Electric Company, acting as general convention chairman. H. M. Crawford, sales manager of the Pacific Gas and Electric Company, will be in direct charge of the exposition, with Geo. P. Egleston acting as director of the exhibits and A. C. Joy as director of advertising, publicity and entertainment. Mr. Egleston is general manager of the H. R. Basford Company, of San Francisco, and Mr. Joy is manager of the publicity and advertising department of the Pacific Gas and Electric Company.

Plans for the convention and exposition include many novel features among which will be a daily cooking school, and contests in kitchen and basement design, the winning designs to be built and exhibited in the Auditorium.

Canadian Gas Association

THE Canadian Gas Association enjoys an enviable reputation for attractive convention programs of papers on the most timely subjects. The 1931 convention to be held at the Windsor Hotel in Montreal, Thursday and Friday, June 4 and 5, promises to maintain that reputation.

Following is the list of papers arranged for presentation at that time:

"High-Pressure Distribution Systems for Suburban Towns," by A. C. Frey, manager, Worcester Gas Light Co., Worcester,



J. P. Coghlan

Mass.; "Intensive Selling of Gas House Heating," by S. F. Morgan, gas heating engineer, New Bedford Gas & Electric Co., New Bedford, Mass.; "Gas Prospects in the Prairie Provinces of Canada," by Dr. George S. Hume, geologist, Department of Geological Survey, Ottawa, Ontario; "The Klone Dry Gas Holder," by Max Klone, engineer, August Klone Company, Dartmund, Germany; "Some Possibilities in the Design of Small Gas Plants for Flexibility of Output," by E. W. King, engineer, Hamilton By-Product Coke Owens, Ltd., Hamilton, Ont.; "Aeroplane and Cyclone Insurance for Gas Holders," by Harry Anderson, insurance division, The Peoples Gas Light & Coke Company, Chicago, Ill.; "Modern Trends in Gas Engineering," by E. A. Munyan, manager, gas department, Union Gas & Electric Co., Cincinnati, Ohio; "Gas Merchandising with Relation to Distribution of Load," by O. L. Maddux, industrial gas engineer, United Gas & Fuel Co. of Hamilton, Ltd., Hamilton, Ont.; "Design, Laying and Maintaining Gas Pipes Crossing Under Railroads," by Olin F. Flumerfelt, chief engineer, Iroquois Gas Corporation, Buffalo, N. Y.; "Reclaiming Old Gas Pipes by Sandblasting," by E. A. Cummings, vice-president, Moncton Tramways, Electricity & Gas Co., Ltd., Moncton, N. B.; "Progress in the Development of Major Long-Distance Transmission Lines," by W. G. von Gemmingen, consulting engineer, New York, N. Y.; "Natural Gas in Ontario," by Colonel R. B. Harkness, commissioner natural gas, Province of Ontario, Toronto; "Industrial Gas in Montreal," author to be announced.

Such a program should attract a record breaking attendance and it is Secretary G. W. Allen's recommendation that reservations be made early direct with the Windsor Hotel.

The entertainment features of the convention cannot be announced at this time, but assurance is given that they will be highly interesting. A feature of the convention will be an inspection of the large coking plant of the Montreal Coke and Manufacturing Company at Ville LaSalle, Montreal. Many prominent men in the gas and allied industries will be in attendance at the annual dinner.

Reduced fares on the certificate plan have been granted by all prominent railroads in Canada and the United States. Further details may be secured from George W. Allen, secretary-treasurer, Canadian Gas Association, 21 Astley Ave., Toronto 5, Ont.

Southern Gas Association

PLANS for an attractive program for the annual convention of the Southern Gas Association are well advanced and the meeting will open at the Signal Mountain Hotel, Chattanooga, Tenn., on June 9, continuing until June 11. The following

will give an idea of what those attending can expect. In several cases, acceptances have not been received which may necessitate changes.

The general sessions will be addressed by Ernest R. Acker, of Poughkeepsie, and chairman of the American Gas Association Commercial Section; C. S. Reed, rate consultant, of New York, N. Y., on "Gas Rates in the Newest Forms"; John Swanson, of Minneapolis, newly-elected president of the Mid-West Gas Association, on "Public Relations" and Floyd Parsons, of the *Gas Age-Record*.

The program for the Technical Section arranged by Wm. A. Dunkley, includes the following papers: "The Use of Butane to Enrich Manufactured Gas," O. M. Setrum, Philfuels Company; "Oil Fogging and Humidifying Natural Gas," E. C. Kollock, Southern Cities Public Service Company; "Gas Distribution with High-Pressure Storage Holders," A. M. Spencer, Columbus Gas Company; "Problems Encountered in the Installation of House Heating Equipment," Henry S. Jones, Memphis Power and Light Company; "Problems in the Distribution and Use of Mixtures of Manufactured and Natural Gas," James A. Yunker, Louisville Gas & Electric Co.; and "Design of Distribution System for Small Cities and Towns," O. L. Bradshaw, Mississippi Power and Light Company.

The Commercial Section and American Gas Association Regional Sales Conference program, as announced by E. N. Avegno, includes the following papers: "Developing Volume Water Heating Sales," S. C. Bratton, Southern Industrial Engineering Company; "Merchandising in a Group of Small Properties," John W. Owen, Central Florida Gas Corporation; "Merchandising in an Independent Small Property," A. A. Whitlock, Piedmont Utilities Company; "Selling a Premium Fuel," A. J. Peters, Consolidated Gas Company; "Conversion Factors," P. McDonald Biddison, Southern Natural Gas Company; "Large and Small Boiler Conversions," Chas. M. Rogers, New Orleans Public Service Company; and "Planning and Fulfilling the Company's Sales Development Program," R. C. Anderson, Mississippi Power and Light Co.

Mid-West Gas Association

AT the annual convention of the Mid-West Association held in Dubuque, Iowa, April 13 to 15, John K. Swanson, vice-president and general manager, Minneapolis Gas Light Company, Minneapolis, Minn., was elected president for the ensuing year. Mr. Swanson is the subject of "Our Own Who's Who" in this issue of THE MONTHLY.

Other officers elected are: W. E. Derwent of Rockford, Ill., first vice-president; R. L. Klar of Des Moines, Iowa, second vice-president; and R. B. Searing of Sioux City, Iowa, secretary-treasurer.

The following were elected as members of the Council for a two years' term: E. J. Boyer, Minneapolis; T. T. Parker, Omaha; Ira Steele, Des Moines; and H. E. Littig, Davenport.

Ohio Gas and Oil Men's Association

THE convention of the Ohio Gas and Oil Men's Association was held on March 17 and 18 at the Deshler-Wallick Hotel in Columbus, Ohio, with more than 500 members in attendance.

The first meeting was called to order by President Lawrence K. Langdon, general counsel of the Union Gas and Electric Company, Cincinnati. Governor George White of Ohio, and a former gas and oil producer, made the principal address of the general session, which was responded to by John McMahon, vice-president of the Northwestern Ohio Gas Company.

The annual report of President Langdon showed the rapid growth in interests and influence of the Ohio Association and he complimented in high degree the efforts executed by the secretary-treasurer of the association, Wm. H. Thompson, of Columbus.

The general session adjourned into three sectional meetings. The meeting on production of natural gas was under the leadership of J. G. Hank, superintendent of the East Ohio Gas Company, Cleveland.

The second meeting on distribution of natural gas was under the leadership of E. A. Munyan, manager of the gas department, of Union Gas and Electric Company, Cincinnati, and in this section three illustrated papers were presented; one by N. S. Moore, distribution engineer of the Ohio Fuel Gas Company, Columbus, entitled, "Distribution Plant Design"; one entitled "Mechanical Automotive Equipment in Gas Distribution," by A. C. Cherry, superintendent of distribution, Union Gas and Electric Company, Cincinnati, and one entitled, "Detection of Gas Leakage in the Gas Distribution Systems," by Chas. T. Turner, chief chemist of the East Ohio Gas Company, Cleveland.

The third sectional meeting was held on public relations, under the leadership of E. N. Thorpe, assistant general manager of the Ohio Fuel Gas Company of Columbus. This was the first public relations meeting of the association.

Tuesday evening the annual banquet was held in the ball room of the Deshler-Wal-



L. K. Langdon

Convention Calendar	
A. G. A. Executive Conference, Ambassador Hotel, Atlantic City, N. J. May 1 and 2.	National Electric Light Association, Atlantic City, N. J. June 8 to 12.
International Chamber of Commerce, Washington, D. C. May 4 to 9.	Southern Gas Association, Chattanooga, Tenn. June 9, 10, and 11.
National Fire Protection Association, Toronto, Ont. Week May 11.	Advertising Federation, New York, N. Y. June 14 to 18.
A. G. A. Natural Gas Department, Peabody Hotel, Memphis, Tenn. May 11 to 14.	A. G. A. Domestic Appliance Course, Testing Laboratory, Cleveland, Ohio. June 15 to 20.
A. G. A. New York Regional Gas Sales Conference, Lake Mohonk, N. Y. May 19 to 21.	A. G. A. New England Sales Conference, Hotel Griswold, Eastern Point, New London, Conn. June 26 and 27.
A. G. A. Joint Production & Chemical Conference, Hotel Benjamin Franklin, Philadelphia, Pa. May 20 to 22.	Home Service Summer Course, Columbia University, New York, N. Y. July 6 to 24.
Empire State Gas & Electric Association, Safety Division, Briarcliff Lodge, N. Y. May 21 and 22.	Pacific Coast Gas Association, San Francisco, Calif. Aug. 31 to Sept. 5.
Wisconsin Utilities Association, Accounting Section, Racine, Wis. May 28 and 29.	American Electric Railway Association, Atlantic City, N. J. September 26 to October 2.
Institution of Gas Engineers, London, England. June 2, 3, and 4.	American Gas Association, Atlantic City, N. J. October 12 to 16.
Canadian Gas Association, Montreal, Quebec. June 4 and 5.	Bituminous Coal Conference, Pittsburgh, Pa. November 16 to 21.

lick Hotel with President Langdon acting as toastmaster. The principal address was delivered by C. I. Weaver, vice-president of the Ohio Fuel Gas Company, of Columbus. Mr. Weaver spoke on the relations of the industry with the public and told how such relations could be improved. As a matter of entertainment, Michael Fiaschetti, detective, New York, held the audience spellbound with his hair raising tales of crimes and criminals.

The second general session commenced Wednesday morning. An interesting address was made by Edward C. Turner, former attorney-general of Ohio, who discussed the subject of "Public Relations."

An address was made by W. T. Holliday, president of the Standard Oil Company of Ohio, Cleveland, on "Legal and Economic Complications Peculiar to the Oil Industry." Mr. Holliday traced the

trend of the oil industry and stated that a condition of chaos was not improving and heavy losses were occurring through overproduction.

An address entitled, "Safety First," was made by H. L. Sain of the division of safety and hygiene, State of Ohio.

The following officers were elected for the ensuing year:

President, L. K. Langdon, Cincinnati; vice-presidents, Raymond Cross, Columbus; Warren E. Burns, Columbus; secretary-treasurer, Wm. H. Thompson, Columbus; directors, Emmet Curtin, Lima; T. C. Jones, Delaware; John Klise, Wooster; Jas. W. McMahon, Toledo; Jas. Dallan, Lancaster; R. W. Gallagher, Cleveland; K. E. Krich, Columbus; John J. McMahon, Cleveland; E. A. Munyan, Cincinnati; P. W. Lupher, Columbus; John Burnter, Wooster.

Wisconsin Utilities Association

THE Wisconsin Utilities Association conducts a large proportion of its work by mail. Many of its committees transact most of their work in this manner. For the past six years the general officers have been elected in this way. Such an election was recently held and the executive committee, at its meeting on April 10, announced the election of the following officers: President, A. J. Goedjen, Wisconsin Public Service Corporation; vice-president, E. J. Steinberg, The Milwaukee Electric Railway and Light Company; treasurer, Ewald Haase, Milwaukee Gas Light Company; chairman of the general section, R. G. Walter, Wisconsin Power and Light Company; and vice-chairman of the general section, G. V. Rork, Northern States Power Company. The ballots indicate that 287 members voted in the election and all favored those elected. An amendment changing the name of the "Employees' Education Section" to "General Section" was carried by a vote of 281 to 2. John N. Cadby is the executive secretary of the association.

D. E. Callendar, vice-president and general manager of the Wisconsin Gas & Electric Company, will welcome delegates who attend the Accounting Section Convention of the Wisconsin Utilities Association in Racine, Wisc., May 28 and 29. This welcome will open an interesting and instructive program, which will include a talk by R. E. Moody of The Milwaukee Electric Railway and Light Company, on some recent developments; discussion of stores accounting by C. J. Zweck, general store keeper, Wisconsin Power & Light Company; the discussion of developments in classification of accounts by John Dockendorf, The Milwaukee Electric Railway & Light Company; interline ticket and express accounting problems by F. E. Hageman of The Milwaukee Electric Railway and Light Company; a discussion of women's educational work by Miss Erna Burzlaff, Milwaukee Gas Light Company; and a half-day devoted to the merchandise accounting problems which will be discussed from the executive and commercial point of view as well as from accounting. Herbert E. Cliff, of the Public Service Electric & Gas Company, Newark, N. J., and chairman of the American Gas Association Committee on Mechanical Office Equipment, will address the section on mechanical equipment.

In addition the two winners of the Employees' Speaking Contests will be asked to give their winning addresses. A joint luncheon with the Racine Kiwanis Club will be addressed by a speaker selected by the section. There will, also, be an inspection trip through the Racine Gas Plant, with an opportunity to play golf at the Racine Country Club.

The annual banquet of the section will have a short entertainment program followed by a concert presented by the em-

ployees' band of the Wisconsin Gas & Electric Company, after which a dancing party will be arranged for delegates.

John I. Allen, secretary and treasurer of the Wisconsin Gas & Electric Company, is chairman of the Local Arrangements Committee. J. E. Gray, Wisconsin Power & Light Company, chairman of the section, will preside. Officers for the ensuing year will be elected.

New Jersey Gas Association

AT its annual meeting held in Trenton, N. J., on March 27, Louis Stoecker of the Public Service Electric and Gas Company was elected president; John D. Alden, first vice-president; F. A. Lydecker, second vice-president and H. E. Cliff, secretary-treasurer. The following are directors of the New Jersey Gas Association:

W. C. Buell, J. P. Leinroth, H. A. Stockton, John A. Clark, E. J. Menerey, L. N. Yetter, J. P. Hanlan, J. B. Jones, R. R. Young and Chester Grey, ex-officio.



Louis Stoecker

Memphis

(Continued from page 198)

gas, the managements finding that the perfectly controlled heat afforded by natural gas is particularly suitable for baking purposes.

For domestic purposes the use of natural gas has been largely increased through its application to house heating in central plants. From the time of introduction of the gas the Memphis Power & Light Company has continually emphasized this use for gas in its advertising. Newspaper advertising has been used freely, along with half showing of outdoor boards, 300 cards in street cars, fifty-foot reels in suburban picture houses, and direct mail enclosures to a selected list of prospects.

The list of prospects to whom direct mail advertising has been sent was secured by a survey made preparatory to the introduction of natural gas. This survey revealed nearly 10,000 homes in the city where cen-

tral heating plants were installed. A separate card was made for each of these addresses and the list has been the basis of the direct mail campaigns.

In conducting the survey, the company also made a list of all gas-burning appliances; and at the time natural gas was introduced organized special service crews which adjusted all appliances for use of natural gas.

Officials of the Memphis Power & Light Company feel that a reasonably successful job in selling natural gas has been accomplished, and that the fuel will continue to grow in favor by the customers. Its plans have been aggressive, special sales forces directing their attention exclusively to commercial, house heating and general domestic consumption.

Pacific Coast Towns Get Gas Service

SEVERAL towns recently have been given gas service by subsidiaries of Natural Gas Properties, Inc., in various parts of the Pacific Coast states.

These include Camas where service was inaugurated the early part of March by Natural Gas Corporation of Washington, and Bend, given service by Natural Gas Corporation of Oregon. Other Oregon towns to receive service since the first of the year include La Grande and Klamath Falls.

Dunsmuir, California, also has been given service by Natural Gas Corporation of California, which gives this organization completed plants from the Imperial Valley to the northern borderland.

Other plants to be shortly completed include Yreka and Arcata in California, Cottage Grove and Coquille in Oregon, Shelton, Port Townsend, Port Angeles and Anacortes in Washington.

More Gas Used to Produce Electricity

Oklahoma utilized 612,110,000 cu.ft. of natural gas for fuel for the production of electricity by electric public utility power plants in February of this year, according to recent figures reported by the United States Geological Survey. Oklahoma stood fifth among the states in the amount of natural gas consumed for this purpose in February. Texas consumed the largest amount of gas in the production of electricity with the record of 2,860,286,000 cu.ft.

Personal and Otherwise

Allyn C. Taylor has been elected president of the Consumers Gas Company, a United Gas Improvement Company subsidiary, succeeding John Arthur Kerpelman, resigned. Mr. Taylor has been associated with the Consumers Company since 1922 and has been in the gas industry since his graduation from the Massachusetts Institute of Technology in 1906.



A. C. Taylor

William H. West, of the Roberts Gordon Corporation, has been transferred from New England to the Middle West.

Leon Ourusof, formerly connected with the American Radiator Company, has been appointed engineer of the house heating department, Washington Gas Light Company, Washington, D. C.

E. C. Cox, assistant secretary of the Southern Counties Gas Company, Los Angeles, Calif., has been advanced to the position of secretary of that company.

Mrs. Ruth Wakfield, head of the home service department of the Brockton Gas Light Company, Brockton, Mass., for the past five years, has resigned.

Arral Morgan, recently associated with the Dixie Gas and Fuel Company, Houston, Tex., has been transferred to the Beaumont area as division superintendent to fill the position made vacant by the death of T. C. Buchanan.

C. I. Weaver, vice-president and general manager of the Columbus Gas and Fuel Company, the Federal Gas and Fuel Company, and the Ohio Fuel Gas Company, was elected president of those three companies at the annual meeting of the board of directors.

Joseph McKinley has been appointed acting-vice-president in charge of sales by the Equitable Gas Company, Pittsburgh, Pa., taking the place of G. E. Whitwell.

George F. B. Owens has been appointed domestic sales manager of the new business department of The Brooklyn Union Gas Company, Brooklyn, N. Y.

L. W. Heath, Williamsport division manager of the Pennsylvania Power and Light Company, has been placed in charge of natural gas activities of the company.

Homer C. Deffenbaugh, rate expert for ten years of the Rochester Gas & Electric Corporation, has been assigned

the position of chief statistician for the entire Associated Gas & Electric System.

W. L. Mayer has been appointed manager of the San Francisco office of Neilan Company, Ltd., manufacturers of controlling and regulating equipment.

D. L. Sedgwick has been promoted to chief gas engineer of the North American Light & Power Company and subsidiaries.

Walter S. McFarland, secretary of the Southern Counties Gas Company and one of the organizers of the company, resigned recently to devote his time to ranching.

Leon G. Swan, manager of the industrial gas sales department, Lawrence Gas and Electric Company, Lawrence, Mass., has resigned to accept a position as district manager of the Stoker Motor Company, New York, N. Y.

F. B. Hatch, formerly of Fall River, Mass., has been named industrial engineer for the Delaware Power and Light Company, Wilmington, Del.

G. C. Armstrong has been appointed general manager of the Illinois Gas Company with headquarters in Lawrenceville, Ill.

F. B. Seaman, office manager of the Springfield Gas Company, has been advanced to the position of superintendent. Mr. Krautwater has succeeded him as office manager.

Henry A. Warburton, Jr., has been made manager of the Elkon Gas Company, a subsidiary of the National Public Utilities Corporation, succeeding J. R. Kunkle.

T. B. J. Merkt, industrial engineer of the new business department, The Brooklyn Union Gas Company, wrote and directed the sales promotion revue which is being presented throughout the branches and divisions of the company.

Gail C. Atkinson, Coshocton, O., local manager of the Ohio Fuel Gas Company, has been transferred to Covington, Va., where he will become district manager in that territory.

Everett J. Boothby, former manager of the Lowell, Mass., Gas Light Company and during the past year connected with Stone & Webster, in Boston, has been appointed vice-president of the Troy Laundry Machinery Company, Inc., of East Moline, Ill.

S. E. Cowan has been appointed a district manager of the Wasatch Gas Company, in Utah.

Ernest V. Howe has been elected vice-president and general manager of the Newport Gas Light Company, filling the

position left vacant by the death of George B. Austin.

E. A. Olsen, vice-president of Pacific Public Service Company, and its subsidiaries, has resigned from this Standard Oil Company subsidiary, to take over the executive management of the Oklahoma Natural Gas Company with headquarters in Tulsa.

Book Reviews

"INGENIOUS MECHANISMS FOR DESIGNERS AND INVENTORS."

This book contains the combined experiences of more than 100 designers and engineers located in all parts of the world and is just what inventors have needed for years. It will enable any designer or draftsman to acquire easily an expert knowledge of the general subject of mechanisms. The descriptions and illustrations are confined to the important elements or units in automatic machine design, so that time is not wasted in reading about a lot of useless uninforming detail. For instance, in the chapters dealing with intermittent motions, stop mechanisms, reversing mechanisms, overload relief mechanisms, interlocking devices, speed changing mechanisms, and so on, the descriptions relate only to the actual devices or units which perform these different functions. You are told plainly and briefly just what each mechanism does and how it operates. Since these various unit mechanisms or mechanical devices have actually been applied to a great many different types of automatic machines and other mechanical appliances, this book provides a very complete course of study.

All of the mechanisms described are grouped, as far as possible, into chapters according to general types, which, in addition to the complete index, greatly facilitates finding whatever class of mechanical movement is desired. This arrangement also brings together many mechanisms which are alike as to function and purpose but differ entirely in design; consequently, such mechanisms may readily be compared.

The publishers are the Industrial Press, 140-148 Lafayette St., New York City, and the cost is \$5.

J. B. N.

Wiley J. Huddle Dies When Hit By Auto

WILEY J. HUDDLE, fifty-two years old, of Chicago, Ill., consulting engineer, died March 17 as the result of injuries suffered when he was struck by a hit-and-run driver. Mr. Huddle was well-known in the gas industry.

Home Service Activities

Chicago Conference

THE Second National Home Service Conference, held in Chicago, March 23-26 was well attended. Three days were devoted to talks giving technical information on equipment for use of home service directors, and one day was given over to a discussion of the organization and operation of Home Service work. Mrs. Christine Frederick, consultant on consumer selling, spoke on "What the Customer Needs from Home Service"; G. E. Whitwell discussed Home Service work in the changing business conditions. At the luncheon meeting the group was addressed by Charles W. Appleton, vice-president of the General Electric Company, New York.

The speakers at the evening banquet meeting were J. R. Pershall, advertising manager, Public Service Company of Northern Illinois, Chicago, who spoke most interestingly of the relation of home service and advertising. Frank Arnold, director of development, National Broadcasting Company, New York, outlined the growth of broadcasting and the value of program planning.

On Thursday, March 26, papers were presented on the use of gas and its equipment. B. A. Johnson, utilization engineer, Public Service Company of Northern Illinois, Chicago, outlined many factors in the manufacture and use of gas in a subject entitled "What Home Service Workers Need to Know About Gas." His talk was illustrated with slides.

Miss Jessie Read, home service director, Consumers Gas Company of Toronto, Canada, and Miss Ruth Soule, home service director, The Brooklyn Union Gas Company, Brooklyn, N. Y., gave concrete methods as to how this information may be given to their women customers.

H. B. Johns, manager of house heating, the Peoples Gas Light and Coke Company, Chicago, presented the subject of "Gas House Heating" and gave information that most nearly answered the questions that home service workers need to answer in their customer contact work, on gas house heating. This subject was also illustrated with slides of various types of house-heating installations and charts of operation and cost.

A discussion of interest to various sections of the country was that of the "Changeover from Manufactured to Natural Gas." C. A. Nash, general sales manager of the United Light and Power Company, Davenport, Iowa, discussed the plan in changing domestic equipment that was used in Lincoln, Nebraska, by reading a paper which was presented by F. J. Guenther, Iowa Nebraska Light & Power

Company, Lincoln, at the recent Mid-West Sales Conference in Chicago. Miss Ruth Menoher, home service director of the Lincoln company, prepared a helpful paper on "How Home Service Fits Into This Changeover." Miss Menoher was not able to be at the Conference and her paper was read by Mrs. Beulah Hyten, Ottumwa Gas Company, Ottumwa, Iowa.

At the luncheon meeting, B. J. Mullaney, vice-president of the Peoples Gas Light and Coke Company, Chicago, addressed the group on his interpretation of the value of home service in maintaining friendly relations between the woman consumer and the gas company.

The afternoon program opened with a brief description of the work of the A. G. A. Testing Laboratory by N. J. Reiff, of the staff at the Laboratory, in Cleveland.

This was followed by a thorough discussion of the subject "What Home Service Workers Need to Know About Gas Water Heating and Laundry Appliances" by J. G. Ames, assistant to the general manager, Western United Gas and Electric Company, Aurora, Ill.

Miss Dorothy Shank, director of the research kitchen of the American Stove Company, Cleveland, Ohio, presented some useful information in "Factors Governing Baking Results in Gas Ranges." Among other things she discussed methods of heat transference in gas heated ovens, problems of heat absorption, physical factors in baking such as stove construction, positions of pans in oven, effect of humidity and atmospheric pressure in baking and chemical factors of the food ingredients.

Miss Karen Fladoes, home service director of the Equitable Gas Company, Pittsburgh, Pa., and chairman of the Home Service Committee of the American Gas Association, and Miss Ada Bessie Swann, home service director of the Public Service Company of New Jersey, Newark, N. J., presided at the various section meetings of the Conference.

Manufacturers' exhibits of educational material were on display in the meeting room together with a display of the educational and home service literature of the American Gas Association.

Home Service Committee Meeting

THE second meeting of the 1931 Home Service Committee of the American Gas Association convened in Chicago, at the Peoples Gas Light and Coke Company building on Friday, March 27, with nineteen members present. Miss Karen Fladoes, home service director, Equitable Gas Com-

pany, Pittsburgh, Pa., presided. The subjects taken up included work on the five booklets of the new home service manual—a booklet on "Home Calls" being nearest completion and will be available for all Home Service departments in the summer.

At luncheon, the group were guests, at the Palmer House, of the Peoples Gas Light and Coke Company, through P. D. Warren and Mrs. Anna J. Peterson.



1931 Home Service Committee, American Gas Association

Technical Section

R. G. GRISWOLD, Chairman

H. W. HARTMAN, Secretary

K. H. CREE, Asst. Secretary

I. K. PECK, Vice-Chairman

Joint Production and Chemical Conference

HOTEL reservations already made indicate that production engineers and chemists of the industry will have not only the largest but the most representative attendance that they have enjoyed when the Fifth Joint Production and Chemical Conference opens at the Benjamin Franklin Hotel, Philadelphia, Pa., on May 20 for a three-day session.

This conference is held under the auspices of the Carbonization, Water Gas and Chemical Committees of the Technical Section, American Gas Association.

The program follows:

FIRST SESSION

10:00 A.M. May 20

The Chemical Effect of Gaseous Atmospheres in the Bright Annealing of Metals.

R. J. Cowan, Metallurgical Engineer,
The Surface Combustion Corp.,
Toledo, Ohio.

The Girdler Process for Removing Acidic Gases.

R. R. Bottoms, Director of Research,
The Girdler Corp., Inc.,
Louisville, Ky.

The Electron Goes to Work in Industry.
O. H. Caldwell, Editor,
Electronics,
New York, N. Y.

SECOND SESSION

2:00 P.M. May 20

Opening Remarks.

C. R. Locke,
Chicago By-Product Coke Co.,
Chicago, Ill.

Factors Affecting By-Product Ammonia—Credits.

R. S. McBride, Consulting Engineer,
Colorado Building,
Washington, D. C.

Coke Treatment.

E. W. Zimmerman,
Koppers Construction Co.,
Brooklyn, N. Y.

Factors Affecting Seasonal Delivery of Coke.
R. C. Miller,
National Coke and Coal Co.,
New York, N. Y.

OPEN FORUM

THIRD SESSION

10:00 A.M. May 21

Opening Remarks.

T. B. Genay, Chairman,
Water Gas Committee.

Symposium:

(a) Use of Bunker Oils in Middle West.

R. F. Davis, Indiana Electric Corp.,
Fort Wayne, Ind.

(b) Use of Bunker Oils on Atlantic Seaboard.

W. J. Harvey, Public Service Electric and Gas Company, Paterson, N. J.

Safety in Water Gas Production.

John Alden, Jersey Central Power Co.,
Asbury Park, N. J.

The Selection of Bituminous Coals for Water Gas Use.

E. S. Pettyjohn, University of Michigan,
Ann Arbor, Mich.

New Developments and Progress in Carburetted Water Gas Manufacture.

C. A. Schlegel, United Engineers & Constructors, Philadelphia, Pa.

FOURTH SESSION

2:00 P.M. May 21

Significance of Solvent Analysis as Applied to Coal.

Ernest B. Kester, Senior Organic Chemist,
Bureau of Mines Experiment Station,
Pittsburgh, Pa.

A Process for the Reduction of Organic Sulphur in City Gas.

E. J. Menerey, President,
Peoples Gas Company,
Glassboro, N. J.

Some Protective Coatings of Interest to the Gas Industry.

H. A. Gardner,
Institute of Paint and Varnish Research,
Washington, D. C.

Embrittlement of Boiler Steel.

S. T. Powell,
Consulting Engineer,
Baltimore, Md.

Progress Report, Chemical Committee Sub-Committees.

Application of Optical Scientific Apparatus in the Chemical Control of Gas Manufacture.

Louis Shnidman, Laboratory Director,
Rochester Gas and Electric Corp.,
Rochester, N. Y.

FIFTH SESSION

10:00 A.M. May 22

Coke Statistics.

Paul Ryan, Statistician,
American Gas Association,
New York, N. Y.

Report: The Effect of Washing Coal on Coke and By-Products (Lantern Slides).

A. C. Fieldner,
U. S. Bureau of Mines,
Washington, D. C.

Report: Survey of Gas and Coke Making Properties of American Coals (Lantern Slides).

J. S. Haug, Gas Engineer,
United Engineers and Constructors, Inc.,
Philadelphia, Pa.

A Study of Coke Crushing.

L. E. Knowlton,
Providence Gas Company,
Providence, R. I.

SYMPOSIUM PRODUCERS

(a) New Developments (In U. S. & Europe) in Producer Gas Apparatus.

O. B. Phillips.

(b) Economies of Built-in Producers vs. Outside Producers for Small Plants.

C. B. Glover.

SIXTH SESSION

2:00 P.M. May 22

SYMPOSIUM: HANDLING, MIXING AND CONTROL OF PURCHASED GAS INTRODUCTION

J. A. Perry,
United Gas Improvement Co.,
Philadelphia, Pa.

Natural Gas Situation at York, Pa.

Alan E. Lockwood,
R. P. Stevens Co.,
New York, N. Y.

Various Types of Gas Mixing & Control Devices.

R. P. Oliveros,
Semet-Solvay Eng. Co.,
New York, N. Y.

Refinery Gas Situation at Chester, Pa.

R. G. Rinciffe,
Philadelphia Electric Co.,
Chester, Pa.

Coke Oven Gas & Refinery Gas at Baltimore.

John H. Wolfe,
Consolidated Gas Electric Light & Power Co.,
Baltimore, Md.

(Continued on page 232)

Publicity and Advertising Section

DONALD M. MACKIE, Chairman

ALLYN B. TUNIS, Secretary

WILLIAM H. HODGE, Vice-Chairman

Advertising Expenditures of Gas Companies

THIS information is based on reports on gas publicity and advertising expenditures for the year 1929, submitted to the American Gas Association by thirty-eight companies selling manufactured gas and nine companies selling natural gas.

The data presented apply to all gas publicity and advertising expenditures of the reporting companies, excluding amounts spent for coke advertising by companies producing coal and oven gas.

It is felt that this information may be of interest and value to the advertising departments of gas companies for the purpose of comparing their advertising policies with those of other companies.

Publicity and advertising expenditures for the reporting manufactured gas companies averaged \$0.38 per customer per year, as indicated in Table 1. The expenditures of individual companies varied considerably from the average, the minimum being \$0.12 for one of the largest companies in the country which sells gas at a low rate and has a large industrial load. The maximum expenditure was \$1.56 per customer made by a company with 8,500 customers.

Table 1 also shows that the reporting natural gas companies spent \$0.37 per customer per year for publicity and advertising. The maximum expenditure, amounting to \$1.48 per customer, was made by a large natural gas company conducting an extensive house heating campaign. The minimum amount was \$0.20 per customer spent by a company serving 10,000 customers.

The average manufactured gas company spent 0.880 per cent of its gross revenue from sale of gas for publicity and advertising purposes, while the average natural gas company spent only 0.542 per cent of gross revenue. In other words, out of every dollar received from the sale of gas, manufactured gas companies spent approximately 0.9 cent for advertising and natural gas companies spent 0.5 cent.

Comparing the advertising expenditures of manufactured and natural gas companies, it is evident that both groups spent practically the same amount per customer; however, the advertising expenditures of natural gas companies were a considerably smaller portion of gross revenue due to the fact that annual sales and revenue per customer were higher for natural gas companies. Average annual revenue received per customer

By J. V. O'CONNOR

Assistant Statistician
American Gas Association

from the sale of gas was \$43.40 for the manufactured gas group and \$68.80 for the natural gas group.

Table 2 groups the companies according to the percentage of gross revenue spent for advertising. It will be noted that, for the manufactured gas companies, the largest group—eleven companies—spent between 0.76 per cent and 1.00 per cent of gross revenue for advertising.

Table 3 groups the companies according to the amount spent for advertising per customer per year. It shows that approximately two-thirds of both the manufactured and natural gas companies spent between 21 cents and 60 cents per customer per year for advertising.

A study of the data submitted by the reporting companies indicated that no definite relationship existed between annual advertising expenditures per customer and size of company. Companies serving 10,000 customers spent as much per customer for advertising as those serving 200,000 customers. Several other factors influence the advertising expenditures of gas companies such as the policy of the management, competitive conditions, public relations and gas rates.

Table 4 shows how the total advertising expenditures of the reporting companies was divided between various advertising media. It indicates that the bulk of gas company advertising is done through newspapers. Newspaper advertising comprised 60 per cent of the total spent by the manufactured gas companies and 74 per cent for the natural gas companies. Direct mail advertising comprises the advertising medium second in importance to newspaper advertising.

Tables 5, 6 and 7 show how the total advertising expenditures of the reporting companies were divided between four major classes of advertising. The tables indicate that both the manufactured and natural gas groups spent more for merchandise or appliance advertising than any other purpose. For the manufactured gas group, appliance advertising averaged 18.9 cents per customer and accounted for 49.5 per cent of total advertising expenditures. In the case of the natural gas group, appliance advertising amounted to 26.4 cents per cus-

tomers or 70.8 per cent of the total spent for all classes of advertising. Service building and good will advertising occupied a much more important place in the advertising program of the manufactured gas group than the natural gas group. These two classes of advertising represented 49.8 per cent of total expenditures for the manufactured gas companies and only 26.0 per cent for the natural gas companies. The amount spent to advertise the securities of the reporting companies was practically negligible, only five companies indicating expenditures for this purpose.

Table 8 deals with merchandise advertising and appliance sales. It indicates that appliance sales per customer per year averaged \$4.04 for the manufactured gas group and \$5.18 for the natural gas group. It also shows that appliance advertising expenditures amounted to 4.7 per cent of the appliance sales for the manufactured gas companies and 5.1 per cent for the natural gas companies.

In tables 9 and 10, the appliance advertising expenditures of the manufactured and natural gas groups are analyzed to show the relative amounts spent to advertise six important types of gas appliances. Table 9 indicates that the manufactured gas group spent 5.5 cents per customer to advertise gas ranges and practically the same amount on water heaters. Although smaller amounts were spent on house heating equipment and refrigerators, it is significant that nearly 35 per cent of all appliance advertising was devoted to these appliances by the manufactured gas group. While ranges were first in importance in the appliance advertising program of the manufactured gas group, house heating equipment occupied first place in the advertising program of the natural group, followed by water heaters, and ranges were shifted to third place. Both the manufactured and natural gas groups devoted only a small portion of their advertising to laundry equipment and incinerators.

In the analysis of advertising expenditures, amounts spent for coke (by-product) advertising were eliminated because this type of advertising is confined to manufactured gas companies producing coal or oven gas who sell coke to the domestic market. However, coke advertising occupies an important place in

the advertising program of such companies. Analysis of ten selected companies who sell large quantities of coke shows that coke advertising amounts to 32.3 per cent of their total advertising expenditures, and represents 1.5 per cent

of revenue from coke sales. Coke sales per gas customer served amounted to \$13 per year for this group.

Analysis of the advertising methods of the forty-seven reporting companies shows that the publicity and advertising

work of twenty-six companies was done entirely by their own advertising departments, five companies used outside agencies exclusively and sixteen companies used both agencies and their own advertising departments.

ANALYSIS OF GAS PUBLICITY AND ADVERTISING EXPENDITURES OF SOME MANUFACTURED GAS AND NATURAL GAS COMPANIES DURING 1929

NOTE: 1. Some of the reporting companies are combination companies (such as gas and electric) but the data below apply to the gas business only.
2. Amounts spent for coke advertising excluded from the tables below.

TABLE 1
General Data

	Companies Selling Manu- factured Gas	Companies Selling Natural Gas
Number of Companies Reporting..	38	9
Number of Gas Customers Served.	5,025,251	643,703
Gross Revenues of Reporting Companies from Sale of Gas in 1929	\$218,040,421	\$44,323,402
Gas Publicity and Advertising Expenditures in 1929.....	\$ 1,919,873	\$ 240,373
Gas Advertising Expenditures per Gas Customer per Year.....	38.2¢	37.3¢
Gas Advertising Expenditures—Per cent of Gross Revenue from Sale of Gas..	0.880%	0.542%

TABLE 2

Grouping of Companies According to Percentage of Gross Revenue Spent for Advertising

Percentage of Gross Revenue Spent for Advertising	Number of Companies	
	Manufactured Gas	Natural Gas
Less than 0.25%	2	0
0.26-0.50%	5	2
0.51-0.75%	6	3
0.76-1.00%	11	1
1.01-1.25%	5	1
1.26-1.50%	3	1
1.51-1.75%	2	0
1.76-2.00%	2	0
2.01-2.25%	2	1
Total	38	9

Average expenditure was 0.880% of gross revenue for manufactured gas companies and 0.542% for natural gas companies.

TABLE 3

Grouping of Companies According to Amount of Advertising Expenditures per Gas Customer per Year

Advertising Expenditures Per Customer per Year	Number of Companies	
	Manufactured Gas	Natural Gas
Less than 20¢	6	1
21¢- 40¢	13	3
41¢- 60¢	11	3
61¢- 80¢	6	1
81¢-\$1.00	0	0
over-\$1.00	2	1
Total	38	9

Average annual expenditure per customer was 38.2¢ for manufactured gas companies and 37.3¢ for natural gas companies.

TABLE 4

Analysis of Total Gas Advertising Expenditures by Type of Medium Used

Per Cent of Total Advertising Expenditures Devoted to:	Number of Companies	
	Manufactured Gas	Natural Gas
Newspaper Advertising.....	60.3%	74.0%
Direct Mail Advertising.....	10.7%	5.0%
Posters	2.1%	0.8%
Bill Boards	3.9%	3.8%
Radio Broadcasting.....	2.4%	0.4%
Miscellaneous	20.6%	16.0%
Total	100.0%	100.0%

TABLE 5

Advertising Expenditures per Gas Customer per Year

	Number of Companies	
	Manufactured Gas	Natural Gas
Merchandise (Appliance) Advertising	18.9¢	26.4¢
Service Building Advertising.....	15.0¢	1.9¢
Good Will Advertising.....	4.0¢	7.8¢
Securities Advertising.....	0.3¢	1.2¢
Total Advertising.....	38.2¢	37.3¢

TABLE 6

Advertising Expenditures Expressed as Percentage of Gross Revenue from Sale of Gas

	Companies Selling Manufactured Gas	Companies Selling Natural Gas
Merchandise (Appliance) Advertising..	0.436%	0.384%
Service Building Advertising.....	0.346%	0.027%
Good Will Advertising.....	0.092%	0.113%
Securities Advertising.....	0.006%	0.018%
Total Advertising.....	0.880%	0.542%

TABLE 7

Analysis of Total Gas Advertising Expenditures by Class of Advertising

Per Cent of Total Advertising Expenditures Devoted to:	Companies Selling Manufactured Gas	Companies Selling Natural Gas
Merchandise Advertising	49.5%	70.8%
Service Building Advertising.....	39.3%	5.0%
Good Will Advertising.....	10.5%	21.0%
Securities Advertising.....	0.7%	3.2%
Total Advertising.....	100.0%	100.0%

TABLE 8

Merchandise (Appliance) Advertising and Appliance Sales

	Companies Selling Manufactured Gas	Companies Selling Natural Gas
Merchandise Advertising Expense—Per Cent of Total Advertising Expense for all Purposes.....	49.5%	70.8%
Merchandise Advertising Expense—Per Cent of Gross Sales of Appliances...	4.7%	5.1%
Appliance Sales per Gas Customer per Year	\$4.04	\$5.18

TABLE 9

Showing Merchandise Advertising Expense per Gas Customer per Year for Each Type of Gas Appliance

Merchandise Advertising Expenditures per Customer per Year:	Companies Selling Manufactured Gas	Companies Selling Natural Gas
	Gas	Gas
Ranges	5.5¢	6.1¢
Water Heaters	5.3¢	6.8¢
House Heating Equipment*	3.3¢	7.7¢
Gas Refrigerators	3.4¢	3.3¢
Laundry Equipment	0.3¢	0.2¢
Incinerators	0.3¢	0.1¢
Other†	1.3¢	2.2¢
Total	19.4¢	26.4¢

* Including Space Heaters.

† Includes Industrial and Hotel Equipment, etc.

TABLE 10

Showing Percentage of Total Merchandise Advertising Expense Devoted to Each Type of Gas Appliance

Per Cent of Total Merchandise Advertising Expenditures Devoted to:	Companies Selling Manufactured Gas	Companies Selling Natural Gas
	Gas	Gas
Ranges	28.6%	23.0%
Water Heaters	27.5%	26.0%
House Heating Equipment*	17.2%	29.3%
Gas Refrigerators	17.4%	12.4%
Laundry Equipment	1.5%	0.7%
Incinerators	1.4%	0.4%
Others†	6.4%	8.2%
Total	100.0%	100.0%

* Including Space Heaters.

† Includes Industrial and Hotel Equipment, etc.

Carolina Store Transformed Into Modern Salesroom

THAT things are happening in the properties of the Eastern States Gas Company is shown in the photograph of the office and sales floor of the Anderson Gas & Utilities Company at Anderson, South Carolina, which is a subsidiary.

Last January this company sales room was just another store in a city of 15,000 people. Then came C. W. Shroyer, commercial agent of the Eastern States Gas Company, in connection with sales and public relations in North and South Carolina, Georgia, Florida and Alabama. After giving much consideration to making company sales rooms over so that they would reach a maximum

of attraction to the public, Mr. Shroyer and C. J. DeMers, local manager of the company, arranged to thoroughly modernize the interior. As a result, a beautiful hardwood floor was laid, the walls were painted in two-tone colors with a center rail breaking the colors. The office space was set back, the company's safes were placed in the walls, giving more room for appliance display and the office equipment was refinished or renewed.

The outside of the building was also given attention. A new awning and a new sign added greatly to the improvements going on within. The work was entirely completed

within three weeks and its effect upon the company's customers and the people in general was highly gratifying to the management.

An opening and gas appliance showing was staged as a start for a gas range campaign and on March 11 a large throng of people called all day and gave expressions of wonder and astonishment at the improvement.

Those assisting at the opening, besides Mr. Shroyer, were Ed Brewer, of the Ruud Water Heater Company; Mr. Bair, of the Cleveland Heater Company, and J. J. McGrath, of the A-B Stove Co.

Northern Gas Company Completes 900 Miles

RAPID progress is being made on the big 24-inch natural gas pipe line of the Northern Natural Gas Company. More than 900 miles of this line have been completed from the Amarillo, Texas, field to points in Kansas, Nebraska and Iowa. This line crosses the Panhandle section of Oklahoma on its route to northern markets. A 20-inch branch from this line is being completed by the same company to Mason City, Iowa.

The entire project involves construction of 2,691 miles of gas lines to points in Kansas, Nebraska and Iowa. As soon as the company can obtain contracts with the distributing companies which hold franchises in Minneapolis and St. Paul it will extend its lines to those cities.

Ownership of the Northern Natural Gas Company is distributed among three companies. The North American Light & Power Company owns 35 per cent of the capital stock, the United Light & Power Company, 35 per cent and the Lone Star Gas Corporation, 30 per cent.



Redecorated Display Room of the Anderson Gas & Utilities Co., Anderson, S. C.

Commercial Section

E. R. ACKER, Chairman

J. W. WEST, Jr., Secretary

SAMUEL INSULL, Jr., Vice-Chairman

Increasing Gas House-Heating Sales

By O. J. KUENHOLD

HOW can the forward march of gas house heating be continued, in times like the present, at increasing speed if possible? The question is a pertinent one. To answer it, the writer has a rather new plan of sales attack which he believes will be of value to the gas industry.

The field of possible "prospects" for all-gas heating plants is narrowing down. In most cities a considerable proportion of the cream has been skimmed and the time for devising new plans of attack has arrived. Two alternatives are presented. One is to devise sales stunts—more intensive campaigns. The other is to find ways and means of broadening the sales field.

The success of Henry Ford lies largely in his plan of offering good automobiles at lower and lower prices. He found that every drop in price brought a greatly increased number of families within the "prospect" class, and by this plan, later followed by others, he astonished the world by the sales volume he developed. The soundness of this general plan is therefore unquestionable. It is a plan which, modified to suit conditions in the gas house heating field, can be applied with equal success.

This plan is in brief this: To sell gas-fired auxiliary furnaces and boilers of only sufficient capacity to warm the home in fall, spring, and all but the more severe winter weather. The auxiliary central heaters are installed adjacent to the coal-fired central heater.

Such auxiliary heater installations present certain strong appeals to home owners. They cost considerably less than an all-gas replacement installation, are very efficient, and, as coal-fired heaters are least efficient when running light as they do in the milder winter weather, the comparative cost of gas heating shows up to best advantage. Furthermore, coal-fired central heaters are hardest to control in mild weather and require the most work compared to the heat which is delivered. Gas auxiliary heaters thus offer greatly needed convenience.

A central auxiliary heater having half the capacity required for extreme weather will cut out all but 31 per cent of the coal shovelling. In other words, the gas auxiliary heater will be able to maintain required room temperature 69 per cent of the time from September to May, inclusive.

Consider for instance the cool evenings in fall and spring—how much easier it is to start the gas auxiliary than to build and fuss with a coal fire. Then in the

steadier cold but mild weather, the coal fires frequently go out and must be entirely rebuilt, the rooms become overheated and the heat must be wasted by opening windows. When the coal fire is operated at a low combustion rate it is not hot enough to fully consume the smoke or the fuel. The efficiency is very low compared to that of a gas-fired auxiliary central heater. The advantages of a central auxiliary gas heater are very great.

From the standpoint of sales volume the number of prospective purchasers of house heating equipment is easily quadrupled by promoting the sale of such auxiliary heaters, because the cost is approximately half of that of an all-gas installation and the advantages in proportion to cost are much greater. The prospects are easier to land because they do not definitely and finally have to commit themselves to gas and less investment is involved.

Once an auxiliary central gas heater is installed, human nature guarantees that it will be used, for it is so much easier to simply light the gas fire than the messy job of starting a coal fire. Few owners of such auxiliary heaters will start a coal fire until steady cold weather sets in. Most owners will postpone starting coal fires until they have to. It is entirely reasonable to expect that numerous converts to all-gas heating will be made.

From the standpoint of an attractive gas load, auxiliary heating offers decided advantages. That the all-gas heating load carries with it the problem of the peak loads is well-known. Auxiliary gas central heaters offer a load which drops off when the high peaks of the all-gas heating plants come on, for the auxiliary installations automatically revert to coal in peak load periods. The total annual house heating load which gas companies can take on is thus greatly increased without necessity for increased investment in gas plant.

A few years of active promotion of auxiliary central heaters should have marked levelling effects upon the house heating load curve. The economic advantages are self-evident. In the natural gas field, where gas home heating is done upon a comparatively enormous scale, the severe peak loads and resulting gas pressure drops have made auxiliary installations quite popular. It is in fact certain that, without a considerable proportion of the home heating installations being on this order, many natural gas

companies would be unable to handle their peaks. With increased house heating loads, manufactured gas companies will in time face the same problem unless steps, such as have been outlined, will be taken in advance.

Auxiliary warm air gas furnaces are in particular attractive. Easy to install without disturbance to the existing heat distribution system, such installations are low in cost. The heated air from the auxiliary furnace is poured into the casing of the coal furnace. The cold air supply is taken from the basement, from the base of the coal furnace casing, or from the cold air return duct. Best results, sure to be successful, are obtained from gas furnaces especially designed for auxiliary purposes. Such furnaces are lower in height than the usual gas furnaces and have certain special features, description of which is outside of the scope of this article.

For rapid development of such an off-peak heating load the gas rates granted may require special attention in some instances. Where the heating rate does not become effective until a certain minimum seasonal gas consumption is reached, the inducement for this type of heating may be insufficient to attract quick sales volume. The off-peak nature of the load may make it worth while to offer rates which do not require so high a minimum before the heating rate becomes effective.

Considering the buying moods of today, the auxiliary central heater field probably offers the best chances for increased house heating sales. Jobs can be landed which are impossible to land in any other way. Many prospects now dead may be converted into live ones. And gas home heating can go forward at increasing pace. Less annual gas consumption per unit but far more units and a greatly superior gas load. Large volume because you reach the masses—as Henry Ford does.

Kansas Fields Active

SEVERAL towns in northern Oklahoma and other states are now securing natural gas from fields which have been found in twelve of the fourteen southern tier of Kansas counties, adjacent to the Northern Oklahoma border. Commencing at the southeastern corner of Kansas the counties of Cherokee, Labette, Montgomery, Chattanooga, Cowley, Sumner, Barber, Clark, Meade, Seward, Stevens and Morton, are producing natural gas for both domestic and industrial consumption.

Manufacturers' Section

E. S. DICKEY, Chairman C. W. BERGHORN, Secretary DAVID F. KAHN, Vice-Chairman W. E. STEINWEDELL, Vice-Chairman

85 Per Cent of Exhibit Space Allotted

MORE than 85 per cent of the space in the exhibit which will be staged in connection with the thirteenth annual convention of the American Gas Association, at Atlantic City, N. J., October 12-16, was reported allotted on April 22 by C. W. Berghorn, director of the exhibit.

Following is a list of exhibitors and booth assignments in the main exhibition hall of the Atlantic City Auditorium:

	<i>Booths</i>
A-B Stove Co.	425
Adams Bros. Mfg. Co., Inc.	210
Addressograph Co.	—
Air Reduction Sales Co.	206
Alpha-Lux Co., Inc.	228
Aluminate Co., Inc.	116
American Cast Iron Pipe Co.	109, 110
American Gas Furnace Co.	410
American Gas Journal	629
American Gas Products Corp.	—
American Heater Corp.	513, 514
American Lava Corp.	732
American Meter Co.	323, 4, 5; 404, 5, 6
Griffin & Co., John J.	
Helme & McIlhenny	
Maryland Meter Works	
McDonald & Co., D.	
Metric Metal Works	
Pacific Meter Works	
Tufts Meter Works, Nathaniel	
American Radiator Co.	527, 28, 29, 30, 31
American Rolling Mill Co.	220
American Stove Co.	522, 3, 4, 5, 6
Clark & Co. Div., Geo. M.	
Direct Action Stove Co. Div.	
New Process Stove Co. Div.	
Quick Meal Stove Co. Div.	
Reliable Stove Co. Div.	
American Thermometer Co.	136
Associated Gas & Electric System	301
Autogas Corp.	147
Automatic Gas Steam Radiator Co.	140
Bailey Meter Co.	205
Barber Gas Burner Co.	311
Barber-Greene Co.	15
Bartlett Hayward Co.	604
Behringer Co., Edward A.	619
Bingham & Taylor Corp.	223
B-Line Boiler Co.	332
Blodgett Co., G. S.	316
Bristol Co.	828
Brown Instrument Co.	100, 101
Bryant Heater & Mfg. Co.	430, 431
Burroughs Adding Machine Corp.	—
Carrier-Lyle Corp.	626; 710
Central Foundry Co.	705
Chambers Mfg. Co.	240
Chaplin-Fulton Mfg. Co.	319

	<i>Booths</i>
Chapman Valve Mfg. Co.	224
Chicago Bridge & Iron Works	226
Cleveland Co-Operative Stove Co.	709
Cleveland Heater Co.	308, 9, 10
Cleveland Trencher Co.	601, 602
Clow & Sons, James B.	213
Connelly Iron Sponge & Governor Co.	—
Continental Stove Co.	108
Crane Co.	731
.....720, 1, 2, 3, 4, 5; 801, 2, 3, 4, 5, 6	
Cribben & Sexton Co.	614, 615
Crown Stove Works	137
Cruse-Kemper Co.	829A
Cutler-Hammer, Inc.	503
Davis Emergency Equipment Co.	
(Bullard-Davis, Inc.)	127
Dearborn Chemical Co.	518
Detroit-Michigan Stove Co.	
.....606, 7, 8, 9, 10	
Dresser Mfg. Co., S. R.	401, 402
Dun-Rite Clock Device Co.	313
Economy Governor Co.	621
Electrolux Refrigerator Sales, Inc.	Stage
Elliott Addressing Machine Co.	—
Estate Stove Co.	428, 9; 511, 12
EverHot Heater Co.	707
Faraday Refrigerator Corp.	831, 2, 3
Felt & Tarrant	—
Fisher Governor Co., Inc.	701
Floyd-Wells Co.	807
Fox Furnace Co.	—
Foxboro Co., Inc.	703, 704
Gas & Electric Heater Co.	138; 212
Gas Machinery Co.	306
Gas Purifying Materials Co.	620
General Ceramics Co.	118
General Coal Co.	103
General Gas Light Co.	726, 7, 8, 9
Giant Mfg. Co.	204
Gifford-Wood Co.	202
Glenwood Range Co.	632, 3, 4
Gray & Dudley Co.	811
Griswold Co., W. A.	217, 218
Groble Gas Regulator Co.	420
Guardian Gas Appliance Co.	211
Harper-Wyman Mfg. Co.	631
Heating & Ventilating	142
Hoffman Heater Co.	317, 318
Homestead Heater Co.	111
Hotstream Heater Co.	230
Improved Equipment-Russell Engineering Corp.	200
Inertol Co.	203
International Business Machines Corp.	—
Isbell-Porter Co.	829B

	<i>Booths</i>
Jackson Engineering Co.	107
Johns-Manville, Inc.	836, 837
Judelson Dryer Corp.	239
Kelly, Inc., John G.	314
Kernit Incinerator Co.	312
Kompak Co.	328
Koppers Construction Co.	605
Lambert Meter Co.	322
Lamneck Co., W. E.	231
Lattimer Stevens Co.	222
Lavino & Co., E. J.	519
Lawson Mfg. Co.	219
Linde Air Products Co.	133
Littleford Bros.	419
Lovekin Water Heater Co.	623, 624
Majestic Mfg. Co.	117
McWane Cast Iron Pipe Co.	225
Mears-Kane-Ofeldt, Inc.	416
Merco Nordstrom Valve Co.	830
Mettler Co., Lee B.	221
Milwaukee Gas Specialty Co.	427
Mine Safety Appliances Co.	207
Minneapolis-Honeywell Regulator Co.	413, 414
Mitchell Specialty Co.	236
Mohawk Asphalt Heater Co.	706
Moore Brothers Co.	627
Mueller Co.	320
Mueller Furnace Co., L. J.	326
Mulcare Engineering Co.	622
National Tube Co.	302, 3, 4
Ohio Foundry & Mfg. Co.	214
Partlow Corp.	718
Patrol Valve Co.	232
Peerless Heater Co.	711
Peerless Mfg. Co.	233
Pennsylvania Furnace & Iron Co.	415
Perco-Steril Machine Corp.	238
Permutit Co.	201
Philfuels Co.	16, 17
Pittsburgh Coal Co.	517
Pittsburgh-Des Moines Steel Co.	618
Pittsburgh Equitable Meter Co.	227; 305
Pittsburgh Incinerator Co.	809, 810
Pittsburg Water Heater Co.	508, 9, 10
Public Utilities Reports	132
Ray-Glo Corp.	714
Remington Rand, Inc.	—
Republic Steel Co.	113, 14, 15
Reynolds Gas Regulator Co.	417, 418
Robbins Publishing Co.	500
Roberts & Mander Stove Co.	311; 412
Roberts Brass Mfg. Co.	611
Roberts-Gordon Appliance Corp.	229
Robertshaw Thermostat Co.	234, 235

Booths

Roper Corp., Geo. D.....432; 515
 Rudy Furnace Co.....625
 Ruud Manufacturing Co.....407, 8, 9

Safety Gas Lighter Co.....139
 Safety Gas Main Stopper Co.....135
 Sands Mfg. Co.....426
 Savory, Inc.....737
 Selas Co.....730
 Semet-Solvay Engineering Corp.....321
 Simplex Gas Products Co.....708
 Slattery & Bro., Inc., J. B.....237
 Smith Corp., A. O.....520, 521
 Smith Mfg. Co., A. P.....126
 Spencer Thermostat Co.....215, 216
 Sprague Meter Co.....502
 Stacey Engineering Co.....504, 505
 Stacey Bros. Gas Construction Co.
 Roots-Connersville-Wilbraham Div.
 Stacey Mfg. Co.....400
 Standard Gas Equipment Corp.
423, 4; 506, 7
 Stat-Amatic Instrument & Appliance
 Co.....735
 Superior Meter Co.....300
 Surface Combustion Co.....333, 4, 5
 Tappan Stove Co.....329, 330
 Therminsul Corp. of America.....122
 Underwood Elliott Fisher Co.....—
 United Engineers & Constructors, Inc.
421, 422
 United States Pipe & Foundry Co.....501
 Universal Sand Equipment Co.....208, 209

Victaulic Co. of America.....617
 Wailes Dove-Hermiston Corp.....14
 Walker & Pratt Mfg. Co.....411
 Watts Regulator Co.....315
 Welsbach Co.....112
 Western Gas Construction Co.....603
 Western Steel Products Co.....713
 West Gas Improvement Co.....702
 Wilcolator Co.....307
 Williams Radiator Co.....808
 Wood & Co., R. D.....403
 Youngstown Pressed Steel Co.....630
 Youngstown Sheet & Tube Co.....134

Joint Production and Chemical Conference

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A Few Remarks Concerning the Peak Load Discussion.

A. L. Klees,
 Combustion Utilities Corp.,
 Linden, N. J.

Mixed Gas at South Bend, Ind.

W. E. Nichols,
 Northern Indiana Public Service Co.,
 Hammond, Ind.

Gas Mixing Operation and Control in Chicago.

Karl B. Nagler,
 Peoples Gas Light & Coke Co.,
 Chicago, Ill.

OPEN FORUM



"... the best developed procedure for employee training"

At the Third Annual Accounting Conference held at Chicago, April 23 and 24, 1931, the Committee on Relations With Customers gave the following endorsement to the A. G. A. Course in Employee-Customer Relations:

"Your Committee feels the proper training of employees is of the utmost importance in improving relations with our customers and this Course represents the best developed procedure for employee training. A considerable number of the member companies contacted in connection with this Committee's work report they are using this A. G. A. Course and securing excellent results."



"... one of the best investments we have made ..."

H. B. Converse, Director of Public and Employee Relations of Charles H. Tenney and Company, Boston, writes:

"We are having very fine results with this Course in our companies, and feel that it is one of the best investments that we have made along this line."

Enrollments to date, 5,450—*And Growing*

For information, communicate with

AMERICAN GAS ASSOCIATION

420 Lexington Avenue, New York, N. Y.

Gas Appliance and Equipment Developments

Gas Tee Tapping Machine

A small machine for tapping gas service tees into mains has recently been perfected and put on the market by The A. P. Smith Manufacturing Company, East Orange, N. J.

Ford, Bacon & Davis Construction Corp.

Ford, Bacon & Davis Construction Corporation has been formed as a wholly-owned subsidiary of Ford, Bacon & Davis, Inc., New York, to handle all contract construction activities for the entire organization. The new company was organized under the laws of New York State and will have executive offices at 39 Broadway and field offices at Dallas, Texas. Officers of the Company are Edgar G. Hill, president, James F. Towers and William von Phul, Jr., vice-presidents, and Henry F. Storck, secretary and treasurer. Mr. Hill and Mr. Towers are also vice-presidents and directors of the parent organization. Mr. von Phul, Jr., will manage the Dallas office of the new company and direct its field activities in oil and gas pipe line projects.

Bulletin on Dieform Compression Fittings

A new bulletin entitled, "Dieform Compression Fittings," is now being distributed by the Bailey Meter Company, Cleveland, Ohio.

Meter Bulletin

The publication department of American Meter Company has released a new thirty-six page revised bulletin on Meter Provers and Cubic Foot Standards for gas meters manufactured by the D. McDonald and Company factory in Albany, N. Y.

New Coalfire

The Homestead Heater Co., Newark, N. J., has added Coalfire No. 10 to its line. It is available in polished steel and brass finishes for natural or manufactured gas.

Semet-Solvay Gets Koller Rights

The Semet-Solvay Engineering Corporation of New York has acquired patents and manufacturing rights relating to the Koller gas producer and the Koller mechanical grate, together with the industrial gas equipment formerly manufactured and sold by the Gas Research Company and the Smith Gas Engineering Company of Dayton, Ohio. Both of these lines will be further developed and marketed with the present Semet-Solvay Engineering gas and coke plant and welded equipment.

Contributions by manufacturers of gas appliances and equipment to this department will be welcomed by The A. G. A. Monthly. On account of space limitations, all announcements of new products, improvements, etc., should be limited to about 100 words. No attempt will be made to describe each product or give details of construction. For such details address the manufacturer direct. Where justified, photographs will be used to illustrate these brief items. All contributions to this department should be addressed to C. W. Berghorn, Secretary, Manufacturer's Section, American Gas Association, 420 Lexington Ave., New York, N. Y.

The Eastern Service Company, of Boston, Massachusetts, has been selected by Surface Combustion Corporation, Toledo, Ohio, as its New England distributor for SC Domestic Gas-Fired Heating Equipment, Columbus Unit Heaters, and the complete line of standard appliances. The domestic units include the Janitrol Conversion Burner, the Columbus Gas-Fired Warm Air Furnaces and the Heatmaster for automatic house heating, while the standard appliances consist of such equipment as Atmospheric Burners, Confectioners Furnaces, Soft Metal Furnaces, Thrift Bake Ovens, Cauldron Furnaces, etc., which cover a broad field of application.

Moore Issues Brochure

Moore Brothers Company, Joliet, Ill., has recently issued a brochure giving questions and answers about gas-fired circulating heaters and Moore's Puritan Heater in particular. Copies may be obtained by writing to the manufacturer.

New Bulletin

A pressure gage which embodies dead weight tester accuracy and permanence of calibration together with abundant power for the operation of remote type indicators, recorders and control devices is described in a new bulletin entitled, "Power Type Pressure Devices," which is being distributed by the Bailey Meter Company of Cleveland, Ohio.

Robertshaw Issues Bulletins

The Robertshaw Thermostat Company, of Youngwood, Pennsylvania, has issued bulletins describing Robertshaw thermostats for gas-fired industrial appliances. Each bulletin fully describes the construction, operation and methods of in-

stalling one type of Robertshaw Thermostat. Five of these bulletins are available.

Two New Blowpipes

The Linde Air Products Company, 30 East 42nd Street, New York, N. Y., has added two new welding blowpipes to its line of Prest-O-Weld medium pressure apparatus, presenting an entirely new idea in blowpipe design. A detachable valve body, to which the handle is secured by a simple and convenient locking device, enables the operator to change quickly from the standard to different handles without detaching hose or hose connections and without the use of a wrench.

Worthington Publications

Below is a list of all new catalogs, bulletins, etc., released by the Worthington Pump and Machinery Corporation, Harrison, N. J.:

Horizontal Duplex Piston Pattern Oil Pumps, Type S.P. Maximum working pressure: Steam end, 150 lb.; liquid end, Wompc, 750 lb., cast steel, 1500 lb. Specification Sheet W-112-S10, 4 pages.

Power Pumps, vertical triplex single-acting, instructions and parts lists. Specification Sheet D-423-E8, 2 pages.

Horizontal Duplex Piston Pattern Heavy Pressure Hot Oil Pumps, Type S.P. For hot feed or hot flash service at temperatures up to 700° F. Specification Sheet W-112-S11, 4 pages.

Surface Condenser, patented folded tube layer type. For turbo-generator with turbine-driven circulating pump, steam-air ejector as air removal apparatus, and motor-driven horwell pump. Specification Sheet W-200-S10, 4 pages.

Flexpan High-Pressure Joint

The McWane Cast Iron Pipe Company of Birmingham, Alabama, is furnishing an additional type of high-pressure gas joints, known as the Flexpan. It is of the bell-and-spigot type, without bolts, and delivered in the pipe bells, ready to complete in the trench. A folder describing and illustrating Flexpan Joints is available on request.

Continental Unit Heater

The Continental Stove Corporation, Ironton, Ohio, announces a new unit heater complete with automatic controls. This heater can operate on a basis of 125,000 B.t.u.'s per hour.

Compression Fittings and Tubing

The Bailey Meter Company, Cleveland, Ohio, has announced that dieform compression fittings and tubing are now available.

Monthly Summary of Gas Company Statistics

FOR MONTH OF FEBRUARY, 1931

Issued April, 1931, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

REVENUES of manufactured and natural gas utilities aggregated \$63,125,872 in February, 1931, as compared with \$69,274,925 in February, 1930, a decline of 8.9 per cent, according to reports of the Statistical Department from companies serving 13,560,068 customers and representing nearly 90 per cent of the public utility distribution of manufactured and natural gas.

The manufactured gas companies reported revenues of \$32,801,815 for February, a drop of 4.3 per cent from a year ago, while revenues of the natural gas concerns

totalled \$30,324,057, or approximately 13 per cent less than for February, 1930.

Sales of manufactured gas reported for February totalled 31,398,298,000 cubic feet, a decline of 4.2 per cent, while natural gas sales for the month were 67,649,189,000 cubic feet, a drop of nearly 16 per cent. The more pronounced curtailment in natural gas sales was the result in part of the relatively larger proportion of industrial business handled by these companies, as natural gas sales for industrial purposes declined from 19,965,458,000 cubic feet in February, 1930, to 16,879,651,000 cubic feet in February, 1931.

This drop in natural gas industrial sales was most pronounced in the more highly industrialized states of the East and Middle West, the decline in such states as New York, Pennsylvania, West Virginia and Ohio averaging around 27 per cent.

The same tendency towards curtailment in industrial gas sales was also manifest, although to somewhat less extent, in territories served with manufactured gas. In the East North Central States, comprising Illinois, Indiana, Michigan, Ohio and Wisconsin, sales of manufactured gas for industrial purposes declined by nearly 18 per cent.

COMPARATIVE STATISTICS OF 157 MANUFACTURED GAS COMPANIES FOR THE MONTH OF FEBRUARY, 1931

	Month of February			Two Months Ending February 28		
	1931	1930	Per cent Increase	1931	1930	Per cent Increase
Customers	8,929,256	8,910,242	0.3	See February		
Gas Sales (MCF)	31,398,238	32,758,507	— 4.2	65,485,159	66,496,586	— 1.5
Revenue (Dollars)	32,801,815	34,258,211	— 4.3	68,265,111	69,574,202	— 1.9
Gas Produced and Purchased (MCF)						
<i>Gas Produced</i>						
(a) Water Gas	15,633,742	16,204,091	— 3.5	33,636,960	35,260,778	— 4.6
(b) Retort Coal Gas	2,735,895	2,610,030	4.8	5,768,942	5,498,018	4.9
(c) Oil Gas	749,563	729,544	2.7	1,626,539	1,819,226	—10.6
(d) Coke Oven Gas	4,080,042	3,883,964	5.0	8,289,657	8,103,460	2.3
(e) Reformed Oil Still Gas	383,114	144,538	—	707,891	325,245	—
(f) Total Gas Produced	23,582,356	23,572,167	0.1	50,029,989	51,006,727	— 1.9
<i>Gas Purchased</i>						
(a) Coke Oven Gas	9,204,505	9,291,987	— 1.0	19,550,176	19,579,342	— 0.2
(b) Oil Still and Natural Gas	339,838	312,391	8.8	549,883	609,534	— 9.8
(c) Total Gas Purchased	9,544,343	9,604,378	— 0.7	20,100,059	20,188,876	— 0.4
Total Gas Produced and Purchased	33,126,699	33,176,545	— 0.2	70,130,048	71,195,603	— 1.5

COMPARATIVE STATISTICS OF 160 NATURAL GAS COMPANIES FOR THE MONTH OF FEBRUARY, 1931

<i>Customers</i>							
Domestic (Including House Heating)	4,391,429	4,339,655	1.2	<i>See February</i>			
Commercial	217,027	199,878	8.6				
Industrial	15,455	15,253	1.3				
Main Line Industrial	4,412	3,912	12.8				
Miscellaneous	2,489	2,680	—				
Total	4,630,812	4,561,378	1.5				
<i>Gas Sales (MCF)</i>							
Domestic (Including House Heating)	33,795,181	39,221,630	—13.8	74,228,948	79,156,900	— 6.2	
Commercial	5,048,400	5,129,129	— 1.6	11,121,701	10,614,725	4.8	
Industrial	16,879,651	19,965,458	—15.5	34,490,048	41,502,463	—16.9	
Main Line Industrial	11,513,781	15,204,324	—24.3	23,260,072	29,858,080	—22.1	
Miscellaneous	412,176	782,219	—	938,966	1,622,154	—	
Total	67,649,189	80,302,760	—15.8	144,039,735	162,754,322	—11.5	
<i>Revenue (Dollars)</i>							
Domestic (Including House Heating)	22,171,656	25,177,838	—11.9	48,426,092	51,078,545	— 5.2	
Commercial	2,449,182	2,590,212	— 5.4	5,311,111	5,233,009	1.5	
Industrial	4,071,630	5,042,862	—19.3	8,282,840	10,348,110	—20.0	
Main Line Industrial	1,523,148	2,001,790	—23.9	3,020,686	3,860,682	—21.8	
Miscellaneous	108,441	204,012	—	233,825	387,265	—	
Total	30,324,057	35,016,714	—13.4	65,274,554	70,907,611	— 8.0	

Associations Affiliated with A. G. A.

Canadian Gas Association

Pres.—A. T. Leavitt, Hamilton By-Product Coke Ovens, Ltd., Hamilton, Ont.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association

Pres.—William J. Welsh, New York & Richmond Gas Co., Staten Island, New York.
Chairman Gas Section—M. F. Clement, Rockland Light & Power Co., Middletown, Ind.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

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Pres.—H. A. Kleinman, Peoples Power Co., Moline, Ill.
Sec.-Tr.—George Schwaner, 305 Illinois Mine Workers Bldg., Springfield, Ill.

Indiana Gas Association

Pres.—T. L. Kemp, Indiana Consumers Gas & By-Products Co., Terre Haute, Ind.
Sec.-Tr.—P. A. McLeod, Northern Indiana Power Co., Huntington, Ind.

Michigan Gas Association

Pres.—Prof. A. H. White, University of Michigan, Ann Arbor, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Maryland Utilities Association

Pres.—Adrian Hughes, Jr., Baltimore, Md.
Sec.—D. E. Kinnear, 803 Court Square Bldg., Baltimore, Md.

Mid-West Gas Association

Pres.—John K. Swanson, Minneapolis Gas Light Co., Minneapolis, Minn.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities

Pres.—A. E. Bettis, Kansas City Power and Light Co., Kansas City, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association

Pres.—M. B. Webber, Arlington Gas Light Co., Arlington, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—F. M. Goodwin, Boston Consolidated Gas Co., Boston, Mass.
Sec. Operating Div.—P. R. Buchanan, Hartford Gas Company, Hartford, Conn.
Chairman Sales Div.—J. J. McKearin, Lowell Gas Light Co., Lowell, Mass.
Sec.-Tr. Sales Div.—Robert D. Stuart, Jr., Fall River Gas Works Co., Fall River, Mass.
Chairman Industrial Div.—Chas. H. O'Donnell, Boston Consolidated Gas Co., Boston, Mass.
Sec.-Tr. Industrial Div.—Phillip A. Nelles, Jr., C. H. Tenney Co., Boston, Mass.
Chairman Acctg. Div.—C. N. Alexander, C. H. Tenney & Co., Boston, Mass.
Sec.-Tr. Acctg. Div.—Otto Price, Boston, Mass.
Chairman Manufacturer Div.—A. M. Slaterry, The Hoffman Heater Co., Boston, Mass.
Sec.-Tr. Manufacturers Div.—J. H. McPherson, Clow Gasteam Heating Co., Boston, Mass.

New Jersey Gas Association

Pres.—Louis Stoeker, Public Service Electric & Gas Co., Newark, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

Ohio Gas and Oil Men's Association

Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

Oklahoma Utilities Association

Pres.—S. I. McElhoes, Southwestern Light & Power Co., Oklahoma City, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

Pacific Coast Gas Association

Pres.—R. E. Fisher, Pacific Gas & Electric Co., San Francisco, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association

Pres.—E. G. Boyer, Philadelphia Electric Co., Philadelphia, Pa.
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

Pennsylvania Natural Gas Men's Association

Pres.—George E. Welker, United Natural Gas Co., Oil City, Pa.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

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Pres.—A. J. Goss, Chattanooga Gas Co., Chattanooga, Tenn.
Sec.-Tr.—G. H. Schlatter, Birmingham Gas Co., Birmingham, Ala.

Southwestern Public Service Association

Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Chairman Gas Section—Frank L. Chase, Lone Star Gas Co., Dallas, Texas.
Sec.—E. N. Willis, c/o University Club, Dallas, Texas.

The Public Utilities Association of Virginia

Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

Wisconsin Utilities Association

Pres.—A. J. Goedjen, Wisconsin Public Service Corp., Green Bay, Wis.
Exec. Sec.—J. N. Cadby, 135 West Wells St., Milwaukee, Wis.

Thirteenth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 12-16, 1931

Personnel Service

SERVICES OFFERED

Rate engineer; engineering graduate with accounting training and several years' experience in rate work, covering rates for manufactured, by-product and natural gas service with Public Service Commission. Thoroughly experienced in making budgets, cost analyses, rate studies, designing rates and similar work. 396.

Engineer-Manager, experienced in all branches of gas operations, construction, production, distribution, high- and low-pressure coal or water gas, management of plant up to 20,000 meters or chain of small plants, available on short notice, good record. 397.

Gas Engineer, technically educated and having over 20 years' practical experience in the gas business, is open for any position where an exceptional knowledge of the design, construction and operation of both manufactured and natural gas properties is required. Experience includes transmission, distribution and utilization. 398.

Executive of proven ability with 17 years' experience in all phases of natural gas business desires position in executive capacity with property in stages of construction or in operation. Can give satisfactory references. 399.

Superintendent with 23 years' practical experience in the production and distribution of manufactured gas desires position with managerial responsibility in small property. 401.

Engineer (33) college graduate. Thirteen years' experience in combustion engineering, both industrial and house heating line. Worked on the development, design, laboratory testing and installation and service of two of the leading Gas Conversion Burners for house heating. Desires position with manufacturing company or gas company. Location around Cleveland preferred, but will consider other locations. 402.

Superintendent of large gas plant or operating manager of a group of small plants. Experienced in high- and low-pressure systems. Excellent record in operation and construction. Available at once. 405.

Natural gas executive with twelve years' experience in the design, construction and operation of high-pressure transmission lines, compressor stations and town distribution plants. 406.

Manager-engineer (37) married; thoroughly trained with eight years' practical experience in coal, water, natural, refinery oil still and butane gas, mixing, production, distribution and utilization, high and low pressure. Just finished design and construction of three small plants and distribution systems. Prefer Engineering Department of large utility or District Manager. 407.

Thermal Engineer (M.S.). Long training and experience with industrial gas applications. Familiar with natural and the various manufactured gases and their practical ratings. Desirable expert advisor to industrial gas sales division, and as organizer and director of fuel economics for heavy industrial consumers. Recognized authority on Combustion. Familiar with utility problems affecting sales conditions. Able to promote and direct practical testing and development to extend the use of gas, especially as chemical manufacturing material. 408.

Salesman—experienced in sales promotion of all gas appliances including gas house heating and distribution department of gas business; desires position with good opportunity for advancement. Capable of taking charge of sales or distribution department, small company preferred. Will go anywhere. Married. Age 35. References. 409.

Position of responsibility desired by experienced public utility executive. Possessed of diplomacy and ability in meeting the public. Good education, appearance, personality and business judgment. 410.

Gas engineer, now employed, desires change. Twelve years with large gas apparatus construction company. Experienced in designing, estimating and operating all sizes and types of gas plant equipment. 411.

SERVICES OFFERED

Superintendent or Assistant (36) with sixteen years' experience in operation, maintenance and manufacture of water and coal gas plants. Understand high- and low-pressure distribution. Not afraid of hard work, can obtain results. Applicant willing to go anywhere his training and experience can be of use. 412.

Young practical engineer, eight years' experience in installation, maintenance and laboratory testing of all types of gas appliances; would like connection with manufacturer or gas company in New England or upper New York State. 413.

Salesman having had several years' experience in selling general line of gas equipment. 414.

Superintendent of small, or **general foreman** of large plant; twenty years' broad experience with various companies in manufacturing and construction. 415.

Sales and advertising manager (33) with practical ideas and intimate knowledge of appliance merchandising in gas industry, college education and successful ten-year business record, desires position with public utility or appliance manufacturer. Experience includes retail and wholesale merchandising in highly competitive situations. 416.

Househeating sales engineer would like to make connection with a utility company, or manufacturer. Eight years' experience selling. Have sold gas ranges, water heaters, specialized on gas heating equipment. 417.

Gas engineer desires position as assistant to an executive of a public utility or of a manufacturing company. College education; six years' utility experience; prefers Eastern location. Knows industrial and house heating sales, development of new markets, rate and franchise matters, and public relations. 418.

Sales engineer, eighteen years' experience in utility sales department activities and management. Graduate engineer. Desires permanent position with utility or manufacturer. 419.

Gas engineer (35) technically educated and with eight years' practical experience in the design, construction, mapping and recording of both low- and high-pressure gas mains, is open for position where such knowledge is required; willing to go anywhere. 420.

Superintendent of measurement and distribution of natural gas desires new connection. Twelve years' experience in all branches of the gas industry, including production, transportation, measurement and distribution, both industrial and domestic. Graduate Mechanical Engineer. Employed at present. Age 39. Married. 421.

Experienced, practical gas manager, at present general manager of small properties, desires position as **assistant manager** or **district manager** of medium sized property. Nineteen years' experience water gas, and coal gas, high and low pressure, sales, rate procedure and public relations. Capable, energetic, conscientious executive. Prefer New England or Eastern location. 422.

Manager with twelve years' experience in all phases of natural gas business desires position as manager of small plant or assistant to manager of large plant. 423.

Gas company architect with broad experience in designing office buildings, pumping stations, etc.; familiar with plant layout and construction. 424.

Commercial manager with a record in the electric as well as the gas industry wishes a new connection in which to demonstrate his sales ability. Broad experience and a record of accomplishment in the appliance manufacturing as well as the utility field. Versed in sales research, budget control, surveys, reports, etc. Also publicity and gas engineering. Now located in the east. 425.

POSITIONS OPEN

Leading manufacturer wants **gas range construction engineer** with expert manufacturing knowledge on pressed steel and grey iron construction. Must have successful record and experience with ability to take complete charge. Wonderful opportunity for the man who qualifies. State salary earned in the past and give complete detailed information as to experience. 0207.

Salesman for gas range manufacturer to cover Metropolitan district; want a high class, hard-working producer. Remuneration preferably straight commission basis; would consider drawing account against commission to the right man. 0208.

Distribution engineers who can sell. Old established and reliable organization wants two or three technically trained men (30 to 40 years) experienced in transmission and distribution of oil and gas for work involving considerable traveling. 0209.

Engineer-salesman; (young) good address; should be technical graduate and preferably M.E. for position requiring travel. Prefer man with gas company background and some knowledge of utilization equipment. 0210.

Manufacturer's Representatives to handle well-known line of Circulating Cabinet Heater. Have interesting proposition for representatives who have had experience in handling this type of equipment. 0211.

Sales engineer (28-35) for large eastern gas company to sell gas to hotels, restaurants, hospitals, etc.; prefer man with gas company experience in this work but experienced manufacturer's representative might be acceptable. 0212.

Technical graduate for responsible position in large gas plant on Atlantic Seaboard. Must have degree from recognized Engineering College, preferably in Chemical or Mechanical course. Age between 30 and 35. At least five years' operating experience in gas manufacturing plant and considerable experience in handling men desired. Opportunity for advancement for the right man. Give age, education, experience and salary desired and enclose recent photograph. 0213.

WE KNOW THE MAN YOU WANT

When you are seeking the services of competent personnel, experienced in executive work, engineering or sales activities, communicate with Personnel Service, at A. G. A. Headquarters.

An up-to-date and carefully classified record of those interested in making a new connection is at your disposal, together with the advertising privilege of this page. If the man you want has not listed his qualifications, an advertisement under the "Positions Open" column will instantly put you in touch with him. There is no charge and all negotiations are conducted in strict confidence.

The printer's closing date for copy is the seventh of the month.

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*Deceased.

AMERICAN GAS ASSOCIATION, INC.

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Chairman	D. M. MACKIE	Jackson, Mich.
Vice-Chairman	WILLIAM H. HODGE	Chicago, Ill.
Secretary	ALLYN B. TUNIS	New York, N. Y.
TECHNICAL—Chairman	R. G. GRISWOLD	New York, N. Y.
Vice-Chairman	I. K. PECK	Chicago, Ill.
Secretary	H. W. HARTMAN	New York, N. Y.
Asst. Secretary	K. H. CREE	New York, N. Y.

